The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Edinburgh Meetings

THE Edinburgh meetings of the Society of Chemical Industry, which are still proceeding, have been mainly distinguished so far for their quietness. The social gatherings have been pleasant, the outdoor excursions have been as jolly as the weather permitted them to be, and some of the contributions—such as the President's address and Colonel Pollitt's Messel Lecture—will certainly be remembered. But, as one member rather daringly suggested at the annual business meeting, the report contained no note of inspiration, nothing to quicken a vivid consciousness of a great scientific fraternity, no record of work done to send the member back to his laboratory or his works with a flame freshly lighted within him. If there is really this absence of "soul," it may be retorted that many societies, like men and women, nowadays manage to get on very well without it. And they may do for a time. But in the end a scientific society, like a church or a political party or any other human organisation, will find this indefinable quality of "soul" or "vision" to be essential to real life. All that the annual meeting lacked was some touch of "life." It was in its way well to hear that so much had been saved here, or a few pounds brought in there; that extravagances had been trimmed and some of the services strengthened; that the Messel Fund, in itself an expression of a noble and unselfish interest in science, is steadily saving money, though one might prefer to have heard that it was being as nobly spent as it was nobly given. It all sounded rather like a story of good housekeeping, with no waste in the kitchen, everything bought on the best terms and made the most of. This, of course, is necessary detail; but it has no real message for the membership. If instead, or in addition, the Council could have pointed to some great work the Society had done during the year or even attempted to do and failed, there would have been an instant response. It was this lack of challenge to the interest of the members that we fancy Dr. Cullen felt when he said it all lacked the one thing needful—a touch of inspiration. And even the reply that next year the Council's report may be a really long document is not completely reassuring. For even in the city of John Knox, where sermons still run to some length, one must not accept length as a substitute for higher qualities.

We venture diffidently to note these things because if the Society of Chemical Industry loses its initiative, it loses much more than any mere matter of finance. And changes are taking place which can hardly be ignored. We once suggested that within the last few years the centre of gravity in British chemical industry had been changed by new methods of organisation. Another great step has more recently taken place in the formation of Imperial Chemical Industries. Then, again, on the technical and scientific sides, revolutionary advances are being made. The establishment of a British dyestuffs industry within the space of a few years is too great a fact to be fully realised at the present close range. An even shorter period has witnessed the creation of a synthetic nitrogen industry. In the biochemical field and in fuel technology advances of a fundamental kind are in progress. Have any of these great things come out of the Society or are they proceeding independently of it? May one say in the friendliest possible manner that the Society's great mission is not merely to be a Society that pays its way and comfortably carries on. Its supreme justification lies in the work it does or attempts to do itself or to stimulate in others. And on this higher aspect of things the Council's report to its members is almost silent; it is occupied with housekeeping details. What would do more good than all this excellent accountancy would be some note of inspiration, some challenge to the pride and interest of the entire membership. If Dr. Cullen's comment succeeds in reintroducing some freshening quality of initiative and stimulation, or at least in drawing attention to its necessity, his courage will have been amply rewarded.

Chemistry in Technical Schools

THE pamphlet just issued by the Board of Education—Report of H.M. Inspectors on the Provision of Instruction in Pure Chemistry in Technical Colleges and Schools in England (H.M. Stationery Office, pp. 11, 3d.)—makes very interesting reading. It deals with the amount and character of the instruction in classes in pure chemistry in technical colleges and schools in England which are in receipt of grants from the Board of Education. Approximate figures given for 163 institutions indicate that 1,645 students are taking full-time and 9,883 part-time (mainly evening) courses; 70 per cent. of the full-time students, and 72 per cent. of the part-time, are under 21. The type of course varies. Thus the students may be attending courses leading to the National Certificates in chemistry awarded jointly by the Institute of chemistry and the Board of Education, courses leading to University examinations or the examinations of the Pharmaceutical Society, special courses in applied chemistry, etc.

Particular importance attaches to the information given in regard to part-time students, for this class contains the junior chemical workers and those of subordinate grades who are making an effort to acquire the knowledge necessary for a higher status. A broad classification indicates that of 10,379 part-time students no less than 4,410 were engaged in the chemical industry—2,450 in laboratory work, 1,309 in the factory, and 651 in clerical and commercial work. Many other part-time students would, were a detailed analysis made, probably be found to be engaged in occupations primarily chemical in character. These figures indicate an encouraging tendency on the part of the younger workers in the industry to aspire to becoming something more than mere mechanical robots, and to take a keen interest in their daily work. It must, of course, be kept in mind that the attitude of the leaders of industry is a very important factor in this matter. Most of them encourage their workers to attend classes. The Association for Education in Industry and Commerce, which recently held its annual conference in London, is an interesting example of this trend of ideas.

The report throws light on the working of the scheme for the award of National Certificates in chemistry jointly by the Institute and the Board of Education. The certificates are of two grades. "The standard for the Ordinary Certificate is rather higher than that of the Intermediate Science examination of a University. The standard for the Higher Certificate . . . where no Applied Chemistry is included lies between a pass and an honours degree." The list of part-time courses given indicates that 1,516 part-time students are working for the National Certificate. It is pointed out that in order to be permitted to train students for this purpose, a school must be specially approved as adequately equipped, staffed, and so forth. Thirty-two schools have been approved, and the number is increasing. An important result of this necessity for receiving approval is "that many schools have made very considerable improvement in equipment and organisation in order to obtain for their students the benefits of the scheme." Apart from raising the standard of teaching in this way, the certificate scheme should ultimately have some very important effects on chemical industry.

There is much else in the report that merits attention. The tuition given to students is not of a too narrow and specialised kind. Eighty per cent. of the part-time students receive instruction not only in chemistry but also in physics and mathematics, thereby obtaining a scientific education in the real sense of the term. This is a considerable advance on the position of affairs a few years ago, when "a large number of students were entering upon the study of Applied Chemistry with a totally inadequate grounding in Pure Chemistry, and with no previous or concurrent instruction in Physics." The general standard of qualification of teachers is high, as is that of the accommodation and equipment. A few defects are noted. For example, only the larger schools have libraries, and there are perhaps a large number in which books of reference are not provided. Certain details of the teaching in some schools are criticised. Still, "the defects to which attention has been drawn are the exception rather than the rule." The results are encouraging. "In many of the National Certificate and University courses, and in a few of the courses similar to National Certificate courses, a fair proportion of the students reach a standard which is the more remarkable considering that many of the students can give only part time to study."

The Position of Public Analysts

THE discussions which have been in progress for some time past with regard to the conditions of appointments of public analysts as they are affected by recent legislation and regulations were brought to a head by the meeting between Sir H. Kingsley Wood, Parliamentary Secretary to the Ministry of Health, and a deputation from the Institute of Chemistry and the Society of Public Analysts. The attitude of non-intervention adopted by the Ministry seems to end the matter for the time being, but the facts elicited may usefully be summed up at this stage.

At a meeting of public analysts convened last April by the Public Appointments Committee of the Institute, a statement was prepared urging that for the proper administration of the Food and Drugs Acts, which have been passed in the interests of public health as well as for the prevention of fraud, it is highly desirable that future legislation should provide that the Exchequer should contribute to the cost involved, and that public analysts should thereby be placed in a similar position, as regards security of tenure, etc., as medical officers of health and sanitary inspectors. It appears from the facts stated at the subsequent meeting between Sir Kingsley Wood and the deputation mentioned above, that for many years (owing, apparently, to a misconception) the fee of 10s. 6d. for an analysis was regarded as a statutory one; in fact, 10s. 7d. was the average fee in respect of 232 appointments paid by public bodies to their public analysts as late as 1914. About 1919 it became apparent to some authorities that an increase in the fees paid was overdue. Even so, the increase given was, in the view of the analysts, often insufficient, and in many cases there was no increase. The average fee, even now, reaches 17s. in Scotland only.

Latterly, the responsibilities of the analysts, the intricacy of the work presented to them, and the amount of special apparatus necessary, etc., have greatly increased. It was suggested by the deputation that since Parliament (through the Food and Drugs Acts, departmental orders, regulations, etc.) had ordained the end, it was difficult to believe that it had not also the power to provide the means, and that, failing this power, the Ministry of Health should indicate to the local authorities the necessity for increased and adequate payment. Sir Kingsley Wood took the line that by statute the remuneration was paid by the local authorities and was to be agreed upon between them and the analysts, and that the Minister could not, therefore, attempt to give any directions in the matter to the local authorities, to whom, he thought, the case ought more properly to be addressed. Among other things, he also raised the point that the holding of public appointments conferred a certain status which attracted private work.

As the *Journal* of the Institute points out, "the situation is anomalous, because the Ministry can and does impose further work on the Public Analyst, while apparently it has no right to pay for additional work or to insist that it is paid for." There is also a further point to be considered. This matter concerns not only public analysts, but all chemists. Public authorities—and the public at large—obtain their ideas of the monetary value of chemistry very largely from their relations with public analysts; and ultimately the views thus formed react, for better or for worse, upon chemists as a whole.

Spirits for Industrial Purposes

IT is clear from recent events in the House of Commons that the Government has reached some important convictions as regards the use of spirits for industrial purposes. A short time ago the Treasury announced that it was not at present intended to bring alcohol substitutes, other than methyl alcohol, within the scope of the Spirit Duty. Within the last few days Clause 12 of the Finance Bill has been under discussion in committee of the House of Commons, and has been agreed to. During the discussion, the Financial Secretary to the Treasury, Mr. McNeill, agreed that the use of spirits in industry was by no means of modern origin, but pointed out that until comparatively recently the quantity thus used only amounted to about 4 per cent. of the total consumption. This state of affairs was, however, now considerably altered, and he expressed the (apparently official) view that much larger developments were in the air. The Government were, therefore, asking for much wider powers of discretion in regard to the use of alcohol in its various forms for industrial purposes, on the ground that if the Spirits' Act, with its very strict regulations, remained unmodified, industry would be hampered. In reply to a question from Dr. G. C. Clayton, Mr. McNeill indicated that the clause would make it possible (under suitable regulations) for spirits, made or intended to be made into methylated spirits, to be conveyed by tank wagon or pipe line; there was, however, no provision in the Bill under which such methods of conveyance could be permitted in the case of spirits which were neither methylated nor intended for methylation.

Without further information it is impossible to say whether the future possibilities referred to by the Government speaker were based merely on current knowledge, or whether there are, in prospect, some special developments of which, so far, there is no public knowledge. In any case, it seems that industry can look forward hopefully to an improvement in the Government attitude as regards the use of spirits for industrial purposes.

Chemical Engineers' Programme

THE programme of the Institution of Chemical Engineers for the forthcoming winter session is already taking shape, this body, like its slightly older cousin, the Chemical Engineering Group, being a firm believer in the policy of looking well ahead. Although conferences extending over three days are being arranged for December and March, the Institution, we understand, will welcome papers of outstanding interest on chemical engineering subjects for earlier presentation. For the first conference papers are expected to be submitted on refrigeration, sub-liquid combustion, refractories, and the use of powdered fuel, and it is hoped to arrange for a works visit in connection with one of the papers. A further innovation will be introduced this year in the organisation of two public lectures. The first of these will take place on Friday, October 28, 1927, when the lecturer will be Sir William Bragg. For the second lecture, to be delivered early in the New Year, it is hoped to secure the services of General Georges Patart. The President's reception will be held during the early autumn, when members will have the first opportunity of welcoming Sir Alexander Gibb to office.

Books Received

LEIM UND GELATINE. By Dr. E. Sauer. Dresden and Leipzig: Theodor Steinkopff. Pp. 57. RM3.

THE RAYON INDUSTRY. By M. H. Avram. London: Constable and Co., Ltd. New York: D. van Nostrand Co. Inc. Pp. 622. 42s.

BENN'S SIXPENNY LIBRARY. No. 105: RELATIVITY. By James Rice. Pp. 78. 6d. No. 104; CHEMISTRY. By Percy E. Spielmann. Pp. 80. 6d. London: Ernest Benn, Ltd.

THERMOMETRIC CONVERSION CHART. By Percy L. Marks. London: Crosby Lockwood and Son. 3s. 6d.

CHEMICAL REFLECTIONS. By Stephen Miall. London: Ernest Benn, Ltd. Pp. 39. 1s.

THE MAKING OF A CHEMICAL. By E. J. Lewis and G. King. London: Ernest Benn, Ltd. Pp. 280. 12s. 6d.

TEXTILE COLOUR MIXING. By David Paterson. London: Ernest Benn, Ltd. Pp. 130. 12s. 6d.

HUMAN NATURE IN BUSINESS. By F. Creedy, with a foreword by J. A. Hobson. London: Ernest Benn, Ltd. Pp. 345. 12s. 6d.

The Calendar

July 18–23	Advertising Convention and Exhibition.	Olympia, London.
22	Institution of the Rubber Industry: Education Committee Meeting, 4.30 p.m.	10, Charing Cross Road, London, W.C.
Aug. 31–Sep 7	British Association for the Advancement of Science: Annual Meeting.	Leeds.

Society of Chemical Industry Meeting

Notes and Impressions from Edinburgh

Edinburgh, Tuesday.

THERE is a distinctly northern, if not indeed distinctly Scottish note about the annual meeting of the Society of Chemical Industry in Edinburgh this year. But it is not the less interesting on that account, though many of the figures one expects to see are missing. Heavy business pressure accounts for this to some extent, and the long journey north completes the reason. Mr. Woolcock, the ex-president, is in Berlin ; Dr. E. F. Armstrong, a previous president, is understood to be abroad ; Sir William Pope, yet another ex-president, is detained as an expert witness in a notable patent action. Nevertheless, the attendance, though not as big as last year in London, is satisfactory. There are quite 200 members in attendance, and with guests and friends the total number is not far below 400. At the informal reception at the North British Hotel on Monday evening, given by the chairman (Mr. W. A. Williams) and a committee of the Edinburgh Section, there was a very fair gathering, including a good proportion of ladies, and a very happy and harmonious spirit distinguished the proceedings.

One point strikes the visitor at once, if he had any experience of the London meetings of last year. That is the absence of any special arrangements for dealing with "publicity." There is no press room, as there was in London last year. There are no prepared summaries of papers. It was intended to have the President's address ready for distribution at this morning's business meeting, but the supply went astray somewhere, and as Mr. Carr had only time to give his address in outline members had to be content with only a glimpse of what is generally recognised as a most valuable piece of chemical history and analysis. The Edinburgh meeting, in short, marks a return to the more domestic conception of the Society's mission, and no attempt is being made to interpret its meaning to the public. Apart from this question of policy, however, the local reception committee have performed their duties admirably and done everything one could reasonably expect to anticipate members' needs, while the programme of social engagements of one kind or another should satisfy every taste.

The Debating Hall of the University Union, in which the annual business meeting was held this morning was comfortably filled, without being crowded. On the platform were the Lord Provost of Edinburgh, with Sir T. Hudson Beare, Dean of the Faculty of Science (acting as deputy for the Vice-Chancellor, Sir J. A. Ewing), Mr. F. H. Carr, the president, Mr. E. V. Evans, the retiring treasurer, and Dr. Longstaff, the secretary, while among the audience one noticed Mr. Emile Mond, Colonel Pollitt, the Medallist for this year, Professor Henderson, Dr. Cullen, Dr. Cranston, Dr. Hodgkinson, Dr. Jordan, Mr. G. Scott, and other familiar figures.

The Lord Provost's welcome was distinguished for its Scottish brevity and sincerity. It was followed by a rather fuller statement by Sir T. H. Beare, who, in welcoming the Society on behalf of the University, gave us some gratifying facts as to the increased provision for the teaching of chemistry which the University has latterly undertaken. With a brief and appropriate response from Mr. Carr, the ceremonial part of the proceedings ended and we came at once to the real business.

The annual report of Council, which was circulated before the meeting, covers many points of interest which may only very briefly be noted here. First, one regrets to see the persistence of the downward tendency in the membership. There is a decline on the year of 93—4,802 to 4,709. Five years ago the membership stood at 5,060, and with one exception (1924-25, when there was an increase of 1) there has been a decline each year. It is small, of course, but the matter for regret is that there should be any decline at all, or even thought of decline. The Council express their regret that, though a scheme of propaganda for new members has been actively carried on, the results obtained have not been at all commensurate with the effort. As against this the Chemical Engineering Group reports "another year of successful work and of increasing membership," and the new Fuel Section appears to be doing quite well. The report contains a long passage relating to the journal, which "has engaged the constant consideration of the Council during the past year." The Society will in 1931 attain its jubilee, and in view of the importance of this event, a committee consisting of past presidents has been formed, with Dr. E. F. Armstrong as convener, to consider well in advance the arrangements for its celebration. The Council recommended the acceptance of an invitation to meet in New York next year, and as the Institute of Chemical Engineers are also then visiting the United States, it is hoped that members may be able to join with the chemical engineers in a trip through Eastern Canada and the United States.

The adoption of the report was moved by the President and seconded by Dr. Watt, and the only note of criticism or suggestion came from Dr. Cullen. The report, he remarked, was an excellent record of facts. The full stops, the colons and the semi-colons were all there, but what some of them felt was the lack of any touch of inspiration. One of the problems was how to increase the membership. One of the ways of doing it, in his opinion, was to make the report more of a literary document, and let the members know what the Society was doing and that it existed for a larger purpose than that of merely making ends meet.

The balance sheet was presented by Mr. E. V. Evans, who announced with evident satisfaction that the expenditure had been brought within the income, and that there was a credit balance of £540. £1,200 less had been expended on the journal, while the Society's revenue had increased to the extent of £100. He emphasised that these results had been achieved without sacrificing the services rendered by the Society, but were the result of improved management. *Chemistry and Industry* had published 250 pages less than in the previous year, a reduction of 20 per cent. An appreciable economy had been effected by placing in the hands of Dr. Stephen Miall the responsibility of setting up the complete weekly journal, and by this means certain extravagances had been avoided, while the advertisement revenue had increased.

The accounts were adopted on the motion of Dr. Smith, the new treasurer, and then we came to a very pleasant incident—the presentation to Mr. Evans of a beautiful little volume of signatures of colleagues, in recognition of his seven years' service. Mr. Evans was obviously gratified by this acknowledgment of his work, and replied in one of his neatest little speeches, in which he thanked them for

giving their retiring treasurer something at last that he could really treasure.

The invitation of the American Section of the Society to hold the annual meeting of 1928 in New York was presented in appropriate terms by Professor Menzies, who assured the members of a most cordial welcome from their American colleagues. On the motion of the President, seconded by Dr. Williams, the invitation was unanimously accepted.

Yet another pleasant personal incident was the presentation by the President of the Society's gold medal to Colonel Pollitt. Mr. Carr, after referring to Colonel Pollitt's great achievements in connection with synthetic nitrogen and his valuable work previously on the hydrogenation of oils, appropriately recalled that 21 years ago the Society's medal was presented to Dr. Ludwig Mond, to whom he thought Colonel Pollitt might be regarded as a fitting successor. Colonel Pollitt, who seemed sincerely to appreciate the honour, briefly thanked the Society, remarking that the work referred to must not be regarded as his own, but rather as that of the organisation of which he had charge.

Finally came the President's address on "Chemistry in the Progress of Medicine." Although not delivered in full, owing to want of time, it gave a short but clear account of the successful treatment of disease by chemical methods, of which insulin was a good example, and served as an admirable introduction to the study of this phase of applied science. As Professor Henderson remarked in proposing a vote of thanks, it was obviously an utterance of the greatest scientific interest, which defined with great clearness the present stage of knowledge, and which could only have been prepared by a recognised master of the subject.

The last item of business was the announcement of the names of the four new members of the Council. These proved to be Mr. George Gray, Professor G. T. Morgan, Mr. Guy Radcliffe, and Mr. Harold Talbot. One heard some expressions of satisfaction at the inclusion of two representatives of chemical engineering interests.

It was intended to have a photograph of all the delegates taken immediately after the meeting, but this was made impossible by a heavy fall of rain, which unfortunately interfered with the pleasure of the garden party in the Zoological Park. The luncheon, however, given by the Edinburgh Section and presided over by Mr. Williams, was a great success. There was a very large attendance, and some very good speaking followed.

Chemistry in the Progress of Medicine

Mr. Carr's Presidential Address

At the annual meeting of the Society of Chemical Industry in Edinburgh, on Tuesday, Mr. F. H. Carr, the president, gave a remarkably broad and able address, entitled "Chemistry in the Progress of Medicine." The more important points raised are indicated below.

PURE and applied chemistry, said Mr. Carr, were equally necessary for progress in the application of chemistry in the progress of medicine. Rapidity of progress would best be secured by the closest co-operation in research as carried out in academic laboratories, research institutions, and industrial establishments.

The chief underlying principle of medical treatment to-day consisted in helping the body to produce its own curative agents. The effect of most of the medicines employed was not directly to cure, but to relieve symptoms and secure rest. There were, however, exceptionally among the older drugs a very few which did act as direct curative agents. Cinchona and ipecacuanha, for instance, contained principles—quinine and emetine—which respectively destroyed the parasites of malaria and of amœbic dysentery. How these agents came to be discovered in the dim past must remain a matter for speculation. It was only in very recent times that scientific method had reached the development which rendered possible the search for specific remedies of the type of quinine. To the products resulting from such work the term "chemo-therapeutic agents" had been applied. The purpose of chemo-therapeutic agents was to remove causes rather than to treat symptoms. To this aspect of progress in medicine attention was invited that morning.

The Body Hormones

As had long been recognised, in its normal chemistry the body produced active principles, contained for the most part in the secretions of its glands. These active principles presented the picture of the ideal specific drug, and a study of their chemistry might be expected finally to illuminate the road of experimental investigation by giving knowledge of the particular chemical configurations and physical properties which were associated with specific physiological effects.

These natural remedies—or hormones, as they were called—now regular products of chemical industry, played an important part in medical treatment, in which they were employed to rectify deficiency and also for their effects in modifying and regulating the metabolism of the body. Among the best known of them we had insulin, the principle derived from the pancreas. By some delicately adjusted mechanism, insulin was continually supplied to, and used up in, the tissues of a healthy animal; and through its action the concentration of the sugar in the blood was maintained within a narrow range of variation from the normal. The effect was quantitative, and a minute amount of insulin caused the removal of a large amount of sugar from the blood-stream. So far as its purification had been effected, one gram accounted for the disappearance of 100 kilograms of sugar.

Our knowledge of the hormones was being enlarged almost daily by the many biochemists throughout the world who were actively engaged on the problem of isolating these substances. It could not be claimed with certainty, however, that the hormones from any of the glands so far referred to had yet been isolated in a state of chemical purity. In two or three other instances, however, this had already been done. From the suprarenal and thyroid glands pure crystalline principles had been isolated, and following this their chemical nature had been determined by the organic chemist. These achievements were crowned by success in synthesising them not only in the laboratory but also in the factory. Adrenaline was the lævorotatory modification of a methylaminoethanol derivative of pyrocatechol. This, an optically active substance, possessing all the well-known actions of natural adrenaline—increase in the activity of the heart, rise of blood pressure, and so forth—was now a common product of manufacture.

Thyroxine

Thyroxine was first isolated by Kendall. It was a constituent of a complex protein present in thyroid gland and exerted the powerful pharmacological effects of that organ upon body metabolism. Thyroxine was the di-iodohydroxyphenyl ether of di-iodotyrosine. Its constitution was recently discovered by Dr. C. R. Harington, a young English chemist who worked in Edinburgh for a time. He, in conjunction with Dr. Barger, a distinguished professor of their university, discovered a method for its synthesis, and gave this knowledge freely to the world, with the result that thyroxine was now manufactured

in this country and in Germany. Dr. Barger's name was also connected with work on a third active principle present in the body—namely, histamine, iminazolylethylamine, which was at first thought to be chiefly the product of the putrefactive change of protein, but which it now appeared likely would prove to be produced for functional purposes in the animal body.

The Antitoxins

There was another class of therapeutic substances elaborated within the animal, standing quite apart from the hormones which the body produced as it were in the daily round. He referred to principles produced in the body under the stimulus of foreign substances which were accidentally introduced—poisonous bacteria, for example. These principles—known as antitoxins—were like the hormones, marvellously potent substances. Naturally, to get to understand their chemical nature would be a great advance. Their present knowledge did not, however, go the length of giving them any insight into the real chemical nature of any of them.

It was self-evident that the best therapeutic agency was likely to be one which most nearly imitated nature, therefore Ehrlich regarded it as a promising direction for experimental attack on the problem of producing new therapeutic compounds to follow the procedure indicated by our knowledge of those chemical changes in the living organism. His work had during the past two decades resulted in the introduction of many valuable synthetic remedies. The mainspring which led to these discoveries was Ehrlich's well-known hypothesis. He founded this side-chain theory, as it was called, on what he took to be the principles which underlie these phenomena. He was led to search for synthetic remedies to unite with the protoplasm of the parasite, much as the antibodies appear to do, but to leave unaffected the protoplasm of the tissues of the host. His theory, fantastic in its detail and bold in its conception, had provided a working basis which at least had to its credit a large measure of practical success, and though, with the expansion of our knowledge, it might be expected finally to share the fate of extinction accorded to so many other hypotheses, its author had earned the homage and gratitude of the world for the benefits to which it had given rise.

Organic Derivatives of Arsenic

The most dramatic outcome of Ehrlich's work was the discovery of the organic derivatives of arsenic, which had proved most especially valuable in the treatment of syphilis. The best known and most favoured of these were the derivatives of salvarsan, diaminodihydroxy-arsenobenzene. If administered promptly these derivatives were able completely to eradicate the infection, and long experience had confirmed the superiority of this treatment over any other which had preceded it. Salvarsan was discovered by Ehrlich in the search for compounds which would anchor more freely with the parasite of syphilis than with the tissues of the patient. Perhaps even more important than the new therapeutic agents to which Ehrlich's theory directly gave rise was the fact that this achievement established the value of joint work in chemistry, parasitology and physiology. Ehrlich's assumption that the drug usually acted by direct combination with the parasites had not been supported by the later studies of these arsenic derivatives and other chemotherapeutic agents.

Among other organo-metallic compounds, those of antimony, lead, bismuth, mercury, and gold claimed consideration. This field, hitherto little explored, presented many alluring prospects. The salts of all these metals had found useful application in medicine, but their administration was attended with risks on account of their directly toxic effects. If non-dissociable compounds which had chemotoxic properties could be prepared, it might be anticipated that valuable use would be made of them. Antimony derivatives might surpass arsenic compounds; lead, though dangerous, had proved of value in cancer; and to the use of bismuth and mercury in syphilis the same remark applied. Many mercury derivatives had been used in medicine. Perhaps the most important of these was the derivative of dibromofluorescein, which was introduced under the name of Mercurochrome.

From Ehrlich's conception of the affinity of antitoxins for the cells of invaders they might readily perceive how he came to study the use of dyes in therapeutics; for it was the inherent nature of dyes that they had affinities for, or, in other words, were absorbed by, vegetable and animal cells. That they had a selective action on particular structures was shown by their use in microscopy, whereby different dyes were made to stain different constituents of the same cell. They also had a selective action on particular bacteria as exemplified by the so-called Gram-positive and Gram-negative bacteria, which were distinguished by finding whether they are stained by gentian violet or not. A particularly interesting example of selective action was that of certain racemic dyestuffs which could be resolved into their dextro and lævo-constituents by soaking wool in them, by which process the dextro-isomerides were preferentially absorbed. It did not follow, of course, from these considerations that dyes were useful in therapeutics; an organism which was stained *in vitro* might not be similarly affected in the animal body, and the mere fact of staining did not necessarily imply the destruction of the parasite.

The study of the dyestuffs had been largely directed to the treatment of diseases due to protozoal infections. Infected mice or rats were injected with the dye under test to see whether non-toxic doses exerted a curative effect on the particular infection. In this way very many dyes had been tested against known protozoal diseases, and some useful compounds had been discovered. A striking instance was that of Trypan blue, a tolidine dye obtained by coupling diazotised *o*-tolidine with *H*-acid. This compound had been particularly successful in the treatment of certain diseases of cattle due to an introcorpuscular parasite.

Bayer 205

Following this discovery, an immense amount of patient investigation of the trypanocidal action of dyestuffs led finally to the discovery of substances of great value in treating a much-dreaded tropical disease, sleeping sickness. These were Bayer 205 and Fourneau 309. The constitution of Bayer 205 had not been published, but, like Fourneau 309, it was a complex urea allied to the dyestuffs though itself a colourless substance. The remarkable property was claimed for these compounds that not only did they cause the disappearance of the trypanosomes, but the infected animal remained resistant to infection for a period of weeks or even months; in other words, they afford an immunity not entirely unlike that of antitoxins. Fourneau 309 had little or no action when applied to infecting organisms *in vitro*, though it was effective in destroying them in a living animal, indicating once more that the host participated in rendering effective the destruction of the parasite.

Some of the dyestuffs first studied for their trypanocidal effects had been found more effective as bactericides. An important example of these was acriflavine—3 : 6-diamino-10-methylacridinium chloride. During the war this was found to possess high bactericidal value in the treatment of wounds.

Other derivatives of acridine had been discovered which were suitable antiseptics: 6 : 9-diamino-2-ethoxyacridine, known as rivanol, and 6-amino-3-dimethylamino-2 : 7 : 10-trimethylacridinium chloride, known as flavizide.

From both the practical and the academic points of view, therefore, the further study of the dyes afforded a very promising field of investigation. We might say that the dyes which had so far been introduced into medicine were of real value, as for instance in the treatment of the infections of deep-seated organs. Their full clinical trial in the treatment of bacterial infections of general distribution was as yet incomplete. Although each so far discovered had its limitation of usefulness, it seemed possible and likely that much more valuable ones would be found.

It was not unreasonable, for instance, that we should look forward to ultimate achievements such as the discovery of a compound which would eradicate the germ of tubercle from the body.

Many of the vegetable alkaloids employed in medicine were derivatives of quinoline and *iso*quinoline, as, for example, quinine, morphine, and strychnine. Quinoline derivatives therefore provided a promising field for research. Much time and trouble had been expended during the past twenty years in the endeavour to find a substance which would displace quinine in the treatment of malaria, and numerous new quinoline derivatives had been prepared with that end in view. It was only quite recently that real success had been attained, through the introduction of a new technique of testing. One

could not help suspecting that in this work usefully active substances might have been overlooked through the lack of means for testing them on malaria in animals. A parasite of bird malaria had now been found which, although not identical with the human malarial parasite, reacted in a similar way to therapeutic agents. This discovery had made it possible to test the effects of these quinoline compounds on infected canaries.

As a first-fruit of this new technique there had been recently introduced a new quinine substitute, named plasmoquin, the composition of which was not disclosed beyond the fact that it was an alkylamino-derivative of 6-methoxyquinoline. This compound was said to effect the destruction of the crescent form of the malarial parasite more rapidly than any other known therapeutic agent.

Conclusions

Despite the fact that aspirin, phenacetin, novocaine, and veronal—to mention substances with which all were familiar—were discovered without the use of animal experiments requiring special technique, the day for discovering new drugs in such ways was rapidly passing. It was becoming abundantly clear that the only effective method of studying the relation between chemical constitution and therapeutic properties was by utilising the skill of the chemist, the physiologist, and the physician in different parts of a single problem.

From the considerations which he had presented it seemed that, although the chemical constitution of a therapeutic agent determined its action, the body mechanism also participated in the resultant chemical changes.

Cumulative evidence had been given to show that chemotherapeutic agents acted by undergoing some chemical change in the body, resulting in the formation of the substance which destroyed the infecting organism. This action might be comparable in certain respects with the formation of antitoxins. The most effective agents seemed to be those which by some mechanism set up a continuous supply of the organism-destroying substance. There was evidence to show that this long-sustained action was due to the formation of a depot of the chemotherapeutic agent, and that from this reserve the destructive agent was continually distributed to the tissues. The body also formed depots of vitamins: vitamin-*D*, for instance, was stored in the liver, and it, too, was a powerfully active chemical agent. Rosenheim and Webster in this country and Windaus and Hers in Germany had recently shown that it was formed when ultra-violet irradiation was absorbed by ergosterol, a terpene-like substance related to cholesterol.

Most of the bacterial and parasitic diseases, as well as others due to defective functioning, awaited chemotherapeutic investigation. Chemotherapy was but one of the frontiers of scientific medicine, but it might well prove to be the most important. Certainly this would be so if, in the end, we learned how to stimulate, at will, the chemical processes of bodily defence, and thus to meet every eventuality, or to prepare substances comparable in activity and specificity with diphtheria antitoxin. Progress lay in the direction of biochemistry and more effective working contact between individuals in chemistry, bacteriology, physiology, and clinical medicine.

To establish conditions for delving deeply in chemotherapeutic research, there was the strongest need of co-operation through some central organisation or scheme of registration, so that overlapping might be minimised and workers helped and encouraged to subdivide the field. Chemical experiment must proceed in the very closest association with animal experimentation and with clinical trials.

It was a worthy ideal that chemical industry should aim at joining in a united effort to promote progress by the freest and frankest co-operation and interchange of thought with those engaged in this research, whether it be with rivals in industry or with academic institutions. Chemists became, from the outset, used to the pursuit of common ends, and there was a great multitude of research workers in chemical science who gave thought and energy, unreservedly, to the furtherance of knowledge which they did not even remotely expect would bring to them individual gain. He would claim that those who passed out from research laboratories to serve their industry did not willingly nor entirely abandon that attitude to human service. On the contrary, those men retained a genuine interest in their science, and this interest, and not mere earning, provided their greatest spur and incitement to effort. The necessity of earning need not divert them from serving an ideal.

Vote of Thanks

Professor HENDERSON moved a vote of thanks to Mr. Carr for the address. In the all too brief abstract to which they had listened, they would realise that the address was packed full of information of supreme interest, not only to chemists but to the physiologist, the bacteriologist, the physician—indeed every living individual had a direct and personal interest in the subjects discussed. An address of that character could not be produced except by a master of the subject. (Applause.) When they had all had an opportunity of seeing the address in print, and absorbing it fully, they would rank it among the very best of the Presidential addresses delivered to the Society.

Furthermore, he desired to address to the President their very high appreciation of the services he had rendered to the Society during the last year. They all knew that for a number of years past the Society had been passing through a very trying time—at least so far as the subject of finance was concerned—but the Society had had during that period the great good fortune to have a series of Presidents whose courageous and prudent leadership had enabled the good ship to weather the storm, and, if not actually to reach port, at least to come within hail of it. Mr. Carr had proved himself at all points a worthy occupant of the Presidential Chair.

The Annual General Meeting

ON Tuesday, in the Debating Hall of the Edinburgh University Union, the Society was welcomed by the Lord Provost of Edinburgh, the Rt. Hon. Alexander Stevenson, who acted as chairman of the assembly. Sir T. H. Beare, Dean of the Faculty of Science, then extended to the Society a welcome on behalf of the University. He gave a short account of the great extension which had occurred in the last few years in the organisation, buildings, and teaching in chemical subjects in the University. On behalf of the Society, Mr. F. H. Carr, the President, then thanked the Lord Provost and Sir T. H. Beare for the warm welcome which they had given.

The president then took the chair, and the annual general meeting of the Society was held. Mr. Carr said that they had before them the annual report of the council for the year 1926–27. He called attention to their loss by death of a past president, and a past medallist of their Society, in the person of Professor Ira Remsen. They had also lost a servant of the Society to whom all were very particularly indebted, in the person of Mr. Shonk, who helped to edit the Transactions of the Society for many years. He was taken suddenly ill and died almost within a few weeks of his illness. The Council did its very utmost to help his widow in those circumstances. From the Council they had retirements, as, according to their constitution, they had every year. They were losing many who had served the Society with particular assiduity. He could not mention them by name without mentioning them all, but there were members whose presence at the Council meetings had been always attended by helpful suggestions, kind feeling, and indications that they are perpetually thoughtful of the good of the Society and not of their own personal interests. He moved the adoption of the report.

Dr. H. E. WATT, in seconding, said that he ventured to hope that they would agree with him in regarding the report as a thoroughly satisfactory document. (Applause.) The Council was anxious to render the *Journal* of increasing value to its readers. Their policy might not commend itself to all, but they were surely inspired by a great ambition to make it the best example of its class. The Fuel Section since its inception had done much excellent work. Papers read under its auspices were published in the *Journal*, and the scope of the latter was being correspondingly enlarged. The effort to unify the Abstracts in Pure and Applied Chemistry by

the Bureau had been a step in the right direction; much overlapping had been eliminated, and the issue of a joint index to the whole would be a distinct gain. (Applause.)

Dr. W. CULLEN said he wished to say a word, not in criticism, but in support of the report. He could not criticise because, as a member of the Council, he was in a way responsible for it. He made this suggestion. The facts were there all right, but it lacked just a little bit of inspiration. He thought the best way to increase the membership was to make that report more of a literary document. Tell the members more of what the Society was doing, and probably expand the report to double the present size. (Applause.)

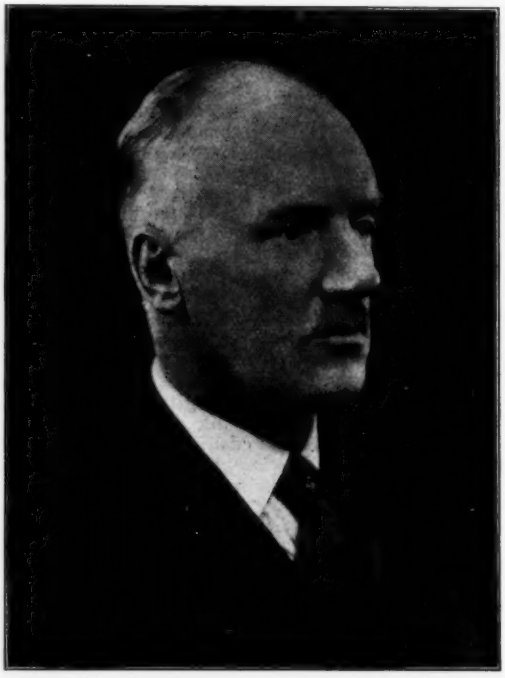
The Chairman thanked Dr. Cullen for his suggestion. The adoption of the report was carried unanimously.

The Treasurer's Report

Presenting his report, Mr. E. V. EVANS, the retiring honorary treasurer, said that the highly successful meetings of recent years had been partly overshadowed by his report of an adverse income and expenditure account. To-day the tables were turned, and the Society's expenditure had been brought within the limit of its income. For the financial year 1926 they were able to record a credit balance of some £540. Compared with the previous year they had expended £1,200 less on the *Journal*, whilst the Society's revenue had increased to the extent of £100. The services rendered by the Society to its members had not been materially curtailed in order to effect this reduction in expenditure; the economies had been achieved mainly as the result of improved management. The cost of the Society's general activities, the sectional grants and all expenditure other than that upon the *Journal* had been only slightly reduced.

With regard to the Messel Fund, it was to be observed that although sundry grants and donations had been made the excess of income over expenditure was of the order of £870. The fund continued to grow, and their assets to-day were £4,000 greater than when the fund was instituted in 1920. He moved the adoption of the balance sheet and accounts for 1926.

Dr. E. W. SMITH, in seconding the motion, paid a tribute to the work of Mr. Evans during his seven years of office as hon. treasurer, and moved a vote of thanks to him.



LIEUT.-COLONEL G. P. POLLITT, D.S.O.: THE SOCIETY'S MEDALLIST

Presentation to Mr. Evans

The chairman said that before putting the motion to the meeting, he wished to hand over from the council to Mr. Evans a memento of the seven years of very happy association with him which they had had. Mr. Evans, during his period of office, had had greater strain than any previous treasurer of their Society, and his policy and his calm way of carrying them through it had resulted finally in the good account which he had presented to them. The members of council who had been members during his term of office had prepared a little book of signatures, which signatures followed these words:—

"Edward Victor Evans, Your colleagues on the Council of the Society of Chemical Industry offer you this sincere mark of their affection in the hope that you will always be mindful of their friendship. They will ever remember with warm appreciation your helpful influence and unstinted devotion to the Society during the seven years you have laboured as its hon. treasurer." He had great pleasure in handing the memento to Mr. Evans.

The accounts were then adopted unanimously. Mr. Evans, in offering thanks for the presentation, said of his successor, Dr. E. W. Smith, that he was an exceedingly capable and sociable fellow; in fact, just the man to manage excellently the finances of the Society.

Annual General Meeting, 1928

Dr. A. W. MENZIES, of Princeton University, New Jersey, then, on behalf of the American Section of the Society, invited the Society to hold its annual general meeting in 1928 in New York. (Applause.) He read a letter from the local secretary of his own section, suggesting that the meeting should take place early in September, so that it might be convenient to members to attend consecutively the meetings of the Society, the joint meeting of the American Institute of Chemical Engineers with the Chemical Engineering group, and of the American Chemical Society, at Swampscott, Massachusetts.

The invitation to hold the next meeting in New York was seconded by Mr. Williamson, and supported by the chairman. The motion was carried unanimously.

Presentation of Society's Medal

The chairman said that he now came to the delightful duty which devolved on him of presenting the Society's Medal to Lt.-Col. Pollitt. The Society's Medal was presented at intervals of not less than two years to the individual who, in the opinion of the Council, had rendered the most conspicuous services to applied chemistry, either by research, discovery, improvement of processes, or any other method. The award was in no way restricted as to membership of the Society or to nationality; and, with all those facts before them, the Council, after giving the most careful consideration to the subject, having many names to consider, decided to award the medal this year to Colonel Pollitt. (Applause.)

Colonel Pollitt had devoted his life—or that comparatively short period of it which had so far been spent—to the chemical industry of Great Britain. Before the War he was one of the first to realise the great importance to chemical industry of Sebatier's scientific observations on the reduction of organic compounds by hydrogen in the presence of a catalyst, and he assisted in the development of the hydrogenation of oils whereby many natural fats had been rendered suitable for use in the manufacture of soap and of edible products. Colonel Pollitt, during the War, gave the very greatest proof of an indomitable character and great braveness, presence of mind, and initiative. When the War concluded Colonel Pollitt was fired with a determination that this country would no longer be without means of obtaining synthetic nitrogen products. He realised that important as it had proved itself during the War, so was it going to prove itself during peace, and it was very largely due to Colonel Pollitt's enthusiasm that Brunner, Mond and Co. and his colleagues on the board of that company undertook to construct a large plant for the production of synthetic ammonia.

The consequences of that decision were now known to them all. There was a large and growing installation, employing three or four thousand men, manufacturing enormous quantities of ammonium sulphate on a basis of high efficiency. That work, as advance in chemical industry so often proved, would certainly not stop there. Colonel Pollitt had already been concerned with important developments such as the production of petrol from coal, acetylene from methane, synthetic methanol from methyl alcohol, and so forth. He had sown the seed of many achievements, the future of which could only be dimly foreseen. Twenty-one years ago the medal was presented to Dr. Ludwig Mond, to whom Colonel Pollitt was a worthy successor in that section of the chemical

industry in which he had worked. Colonel Pollitt, like Dr. Mond, had created another large industry. Such an achievement demanded qualifications of leadership, a grasp of essentials, and, above all, a deep knowledge of fundamental scientific principles; and it was for that combination of qualities in Colonel Pollitt that the award of the Society's medal was made that day. (Prolonged applause.)

In receiving the medal, Lt.-Col. Pollitt said that the honour which the Society had done him that day was one which he appreciated to the very depth of his heart. He could not help feeling, however, that the honour was done to him not so much as a person but as the head of an organisation. It was that organisation which had built up this industry, not himself.

Lieut.-Colonel Pollitt's Career

Below are given some biographical notes regarding Lt.-Col. G. P. Pollitt, the Society's Medallist.

Born in 1878 at Mellor, near Blackburn, Lt.-Col. Pollitt received his early education mainly abroad. His scientific education commenced at Manchester University, where he took the degree of M.Sc.; it was followed by a period of study at the Zurich Polytechnicum. While he was in Switzerland he was awarded the degree of Ph.D. by the University of Basle, for a thesis on the contact process for the manufacture of sulphuric acid. In 1903 he was appointed assistant chemist at Woolwich Arsenal, and in 1904 he became research chemist and manager of the high explosives department of Kynoch, Ltd., at Kynochtown, in Essex. His next appointment was in 1905, as departmental manager for Brunner, Mond and Co., Ltd., where he remained until 1912. In that year Brunner, Mond acquired the firms of Crosfield and Gossage, and Colonel Pollitt acted as a liaison between them and his firm.

The outbreak of war found him acting as general manager to Hydrogenators, Ltd., and Administrateur Délégué of the Société Anonyme d'Hydrogenation de Marseille, posts which he had occupied since 1913, but in August, 1914, he was serving as a despatch rider in the 4th Division in France with the rank of Corporal R.E. From November, 1914, to May, 1915, he served as a second-lieutenant in the Intelligence Corps in France, and thereafter until 1917 he held various commands in the Special Brigade R.E., including that of O.C. Trench Mortar Battalion. In 1917 he joined the infantry and spent six months with the 4th Battalion of the Grenadier Guards, subsequently commanding the 6th and 11th Battalions of the Lancashire Fusiliers. He was wounded four times, and when wounded the last time—in June, 1918—was taken prisoner. For his services he was awarded the D.S.O. and two bars and the 1914 Medal, and was granted the rank of Lieut.-Colonel on demobilisation.

Since the war he has become a director of Brunner, Mond and Co., Ltd., and is the managing director of Synthetic Ammonia and Nitrates, Ltd. He is also a director of the Castner-Kellner Alkali Co., Ltd., the Magadi Soda Co., Chance and Hunt, Ltd., the Buxton Lime Firms, Ltd., Nitram, Ltd., the United Alkali Co., and the International Combustion Co., Ltd.; a member of council and chairman of the Technical Committee, British Sulphate of Ammonia Federation, Ltd.; and a director of the Coal Carbonisation Co., Ltd., and Imperial Chemical Industries, Ltd. He is a member of the Windham Club and the Royal Thames Yacht Club.

"Chemical Reflections"

UNDER this sufficiently descriptive title a volume of essays by Dr. Stephen Miall is being published by Ernest Benn, Ltd. Dr. Miall is always refreshing, and here he is at his best, telling us in his light-hearted, humorous, and shrewdly observant way what he thinks of events and people as they come and go. Gentlest and most engaging of egoists, disclaiming all pretension to authority in chemistry, law, or letters, he yet brings a pleasant flavour of them all into these discourses, and leaves one with a sense of having been in good and entertaining company. Many of these notes have appeared as "editorials" in *Chemistry and Industry*; but even those we have read before will bear a second glance, and in any case many readers will be glad to have them collected together in a shilling volume.

The Hexyl Resorcinol Patent Action

The Defence Opened

THE case of Sharpe and Dohme, Inc., *versus* Boots Pure Drug Co., Ltd. (an account of the opening of which was given in these columns last week), was continued on Monday and Tuesday. On the conclusion of Sir William Pope's evidence Sir Arthur Colefax intimated that the case of the plaintiffs was closed, and Mr. Whitehead proceeded to open his defence. He used Sir William's evidence to indicate his case. Sir William had explained how he had tried seven different methods which had seemed (to him as a chemist) likely to succeed; they had all failed. Mr. Whitehead said that though this evidence was intended to show that so called "general reactions" broke down, it proved conclusively that an able chemist tried them with a reasonable expectation of success even though they were not applied to homologues of the bodies with which they were known to succeed; how much more likely therefore that reactions which had proved successful in the production of the lower alkyl resorcinols should succeed with the higher homologues, especially when it was remembered that the only change in the reacting substances was in the length of the alkyl chain.

No Invention

He contended that there was no invention in applying to the preparation of *iso*butyl resorcinol the methods which had succeeded for the normal butyl resorcinol, especially since Johnson and Lane two years before the date of the patent had been at great pains (in preparing pure *n*-butyl resorcinol for their research) after reviewing the relevant literature to prepare a pure body free from the *iso* body, which they had clearly anticipated might be present as impurity. The plaintiffs could not contend that research and invention were necessary for this step, when they had themselves in fact only described one out of four possible *iso*-amyl resorcinols and one out of many scores of the higher alkyl resorcinols they sought to monopolise. They were in fact saying to the world: "Research is necessary to prepare any body which has not hitherto been made; if you care to carry out that research and make these bodies you shall pay us tribute."

Mr. Whitehead stated that the defendant's research chemists having seen a paper in the scientific press describing the properties of hexyl resorcinol had immediately turned to Johnson and Lane's paper and without any difficulty whatever had prepared the body, without in fact knowing of the existence of the patent in suit. He contended that if such patents were held valid chemical manufacturers might as well close down their research laboratories. The case was one of great importance to chemical industry as well as to patent jurisprudence.

The first witness for the defence was Dr. Oberlander, who briefly stated what each of the cited documents told him as a chemist and in particular said that after reading Johnson and Lane's paper he would try the method therein indicated with every expectation of its success. He would certainly try the experiment in a test tube before setting out on days of laborious search in the literature as the plaintiff's witnesses has suggested a chemist would do. Dr. Oberlander was under cross-examination by Mr. Cripps when the court rose on Tuesday. Owing to the indisposition of Mr. Justice Astbury the court did not sit on Wednesday or Thursday.

British Industrialists' Visit to Germany

REPRESENTATIVES of the Federation of British Industries have been in Berlin, returning the visit paid by the German Federation of Industries to London last November. The British delegation included Sir John Brunner, director of I.C.I., and Mr. W. J. U. Woolcock, general manager of the Association of British Chemical Manufacturers. Meetings were held on Monday and Tuesday. The discussions were, it is believed, chiefly concerned with an examination of the resolutions passed at the Economic Conference of the League of Nations last May, especially in regard to the way in which these resolutions affect Anglo-German trade; and to the Convention for the abolition of import and export restrictions and prohibitions which will come before a diplomatic conference at Geneva next October. The question of double taxation is to be the subject of joint action by the F.B.I. and the German Federation of Industries with their respective Governments.

Micro-Organisms in Chemical Industry

I (b).—The Manufacture of Volatile Fuels and Solvents (*continued*)

By G. Malcolm Dyson, Ph.D., A.I.C.

The first part of this article appeared on June 18. It will be followed by other articles dealing with the application of micro-organisms in other branches of the chemical industry.

Alcohol from Wood Cellulose

THE high cost of production of alcohol from starchy matter, together with the fact that its manufacture therefrom withdraws a considerable amount of foodstuff material from circulation, has led to considerable research work on the production of alcohol from wood waste. At present the processes devised for the achievement of this end are not wholly satisfactory and are not in operation on a commercial scale. The main difficulty lies in getting the cellulose into a soluble, easily fermented form. One of the obvious methods of procedure is to hydrolyse the wood to sugary matter by acid hydrolysis, but the cost of acid and fuel, when calculated out on the basis of gallons of alcohol produced, shows the process to be uneconomic, at least in its present state. The experimental plant for the production of alcohol from wood by acid hydrolysis indicated that the process could scarcely become economic even if the raw material could be obtained for nothing (*e.g.*, maize waste, straw stalks, etc.). In this particular plant shredded sawdust was placed together with dilute sulphuric acid in a rotary acid-proof digester, and heated to a pressure of 60 lb. The resulting pulp, in which solution had only partially taken place, was placed in a diffusion battery of the type used in the extraction of sugar beet and the clear liquor neutralised with limestone, fermented, and distilled in the usual way.

Working on a hard, dry coniferous wood about 20 gallons to the ton were obtained, compared with the usual 80 gallons per ton from grain. Thus, at the outset, apart from other considerations, four times the bulk of material has to be handled in order to secure the same output, a multiplication factor which includes both labour and fuel. The cost of such alcohol was given at 1s. 3d. per gallon, and was worked out on the following basis :—

	Pence per gallon.
Yeast nutrient	1·875
Repairs and materials	3·0
Labour	2·25
Wood and fuel	1·5
Interest at 7 per cent.	1·5
Depreciation at 10 per cent.	2·625
Overheads	2·25
Total	15·000

Such an estimate errs considerably on the optimistic side, since depreciation in such a works is usually more in the neighbourhood of 20 per cent. than 10 per cent., while overhead on costs at 15 per cent. is decidedly below the usual figure for a chemical works. Furthermore, when we remember that alcohol has only two-thirds of the heating value of petrol, it will be seen that such a process has far to go before it becomes a sound commercial proposition.

On the other hand, it cannot be said of fermentation processes that they offer a good alternative method of converting wood cellulose into alcohol. The raw material for such processes is available in abundance, since wood waste and sawdust are just as valuable for alcohol production as whole timber, except that the bark gives considerably less alcohol than the sapwood. It seems that the difficulty lies essentially in the fact that the cellulose aggregates are too large to be dealt with by micro-organisms. The enzymes are capable of dealing with small molecules very easily and almost quantitatively, but as the size of the molecular aggregate gets larger the difficulty of dealing with it by enzyme methods increases until with complexes of the type of cellulose no enzymes are available for their degradation. Undoubtedly, in some future era of synthetic enzymes this difficulty will be overcome, but there are many bridges to cross before such a state is attained.

The constitution of cellulose itself is not known, and it is more than suspected that the cellulose complexes from various woods differ in chemical constitution as well as in physical properties. Be that as it may, the experiments of Denham and Woodhouse have shown that by repeated methylation of cellulose and hydrolysis by very dilute alkali, a trimethyl dextrose (Fig. 1) is produced, a result which, together with

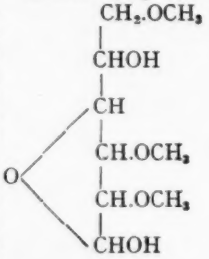


Fig. 1.

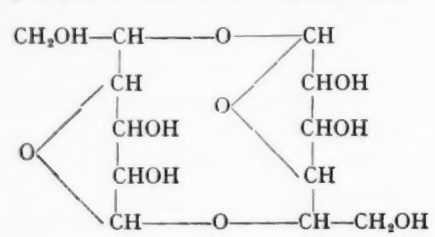


Fig. 2.

other evidence, indicates that cellulose is made up of cellobiose units, cellobiose being itself obtained by the condensation of two sugar chains (Fig. 2). The fact remains, however, that the direct conversion of cellulose to sugar or alcohol must be done by enzyme action if it is to be done at all economically. The difficulty is to find a suitable organism. Boulard in France has obtained an organism of a fungal nature which converts starch directly to alcohol, and he claims to have obtained by its use 11 per cent. more alcohol than when yeast is used. The application of this organism to wood fermentation has not yet proved successful, a remark which is equally true of the organism obtained by Lymn and Langwell from stable manure. It was claimed to be able to ferment almost every form of cellulose under aerobic and anaerobic conditions.

An interesting process has been applied in India to the production of heating and illuminating gas from raw materials such as banana waste, which is fermented by organisms capable of producing hydrogen, methane, and carbon monoxide. In this process the waste is confined in a closed tank and inoculated heavily with a culture of suitable bacteria. Gas equal to 80 per cent. of the space occupied by the material is produced in 24 hours, and the production continues at this rate for a considerable time. The gas contains about 85 per cent. of methane and compares very favourably with town's gas. If such a process could be applied to grass or wood waste it might not only afford a source of comparatively pure methane for the production of pure alcohol, but might also serve as a cheap source of power gas.

The Acetone Fermentations

The enormous demands made upon the acetone-producing industry during the war were undoubtedly responsible for the rapid growth of the fermentation industry with regard to acetone. There are two main processes by which starchy material can be made to yield acetone by fermentation. In the first of these the amylaceous material is fermented directly to acetone and other products, and in the second the fermentation is conducted for acetic acid, which is converted into acetone by dry distillation of the calcium salt.

The first process, that of direct fermentation to acetone, is always attended by the drawback that acetone is only produced in small quantity when compared to the other products of the reaction. Thus numerous bacteria have the power of fermenting starchy matter to acetone and butyl alcohol, but nearly three times the amount of the latter substance is obtained. These bacteria are all very similar, and great difficulty is experienced in differentiating them, for they not only resemble one another morphologically but also culturally. Among the earliest of these bacteria to be patented for the purpose of acetone formation was that of Weizmann, in 1915. This organism was found as a contamination in various cereals, mainly maize. It can be separated from the other bacteria present by boiling the mash for two minutes, when the majority of the other bacteria are killed, while the spores of the *Bacillus granulobacter pectinovorum*, as it is called, remain uninjured. On the inoculation of a sterile maize mash with this organism

fermentation proceeds rapidly and both acetone and butyl alcohol are formed. In addition to this and the *Bacillus macerans* of Freer, which also produces acetone and butyl alcohol, there is the well known organism of Northrup, the *Bacillus acetoethylicus*. This organism has a marked advantage over those previously mentioned in that it produces acetone and ethyl alcohol instead of butyl alcohol. It is therefore practically the only one which is used commercially for the production of acetone. It is found in old potatoes, and is a very short motile bacillus, readily forming spores which are extremely resistant to heat, being unchanged after half an hour's moist heat at 100° C. The optimum temperature for the growth of this organism is 40° to 43° C. Very few organisms show greater susceptibility to the p_H value of the media in which they live than *B. acetoethylicus*. Thus, for example, a p_H of 8·0 favours the production of acids (formic and acetic), while a reaction of p_H 5–7 favours the formation of acetone and alcohol. The yields of acetone from various forms of material are shown in the table below :—

YIELD OF ACETONE FROM VARIOUS BODIES.

Substance.	Per cent.
Corn	10–13
Dextrose	9–10
Raffinose	8–10
Starch	8–10
Beet molasses	8–10
Lævulose	8–10
Sucrose	8–9
Horse chestnuts	7–8
Maltose	6–7
Mannose	6–7
Arabinose	6–7
Dextrin	6–7
Galactose	4–5
Potatoes	2–4
Corn cobs	1–5

In actual practice it has been found that corn cobs offer the cheapest and simplest raw material for the production of acetone. On acid hydrolysis they furnish a syrup containing 25 to 30 per cent. of the sugar xylose, which is almost quantitatively fermented by the *acetoethylicus* organism. Thus, one ton of corn cobs furnished 61 lb. of acetone, 152 lb. of alcohol, and 76 lb. of mixed acids, the whole being valued at about £5 at the present day. This figure indicates that the process could be run quite profitably, provided that corn cobs were cheaply obtainable. The actual fermentation has to be carefully watched in order that the p_H may be regulated between 7·6 and 8·4. Calcium carbonate is added from time to time, and the process is carried out in a vat containing a thick bed of porous cinders. The organisms grow on the cinders and become firmly attached to them, so that a spent charge can be run off and a fresh charge run in without disturbing the culture.

The second method for the production of acetone, that of fermenting for acetic acid and converting the calcium acetate to acetone by distillation, has the advantage of producing no butyl alcohol, for which there is very little outlet. The acetic acid fermentation can be very easily brought about; in fact, the fermentation of dilute alcohol for vinegar is probably the earliest of commercial fermentations. Such a process is, of course, too expensive for commercial acetic acid, for which purpose the two organisms *Bacillus delbrückii* and *Lactobacillus pentoaceticus* are those principally used. The former was introduced by Friedberger for the fermentation of hydrolysed starch solutions to acetic acid, but it seems that the *Lactobacillus* is more especially suited for the acetous fermentation of the xylose of corn cobs. In an experimental plant for the production of acetic acid from corn cobs by means of this bacillus, Fred and Peterson obtained 300 lb. of acetic acid and 320 lb. of lactic acid, valued at about £25. The *Lactobacillus* is a rapidly growing sturdy organism, well able to grow in competition with other organisms, and which can tolerate a fairly high percentage of acid.

Among the more interesting of the fermentation processes used during the war for the production of volatile solvents, that used by the Hercules Powder Co. is perhaps the most important. It involved the fermentation of seaweed to acetic acid and other volatile acids. The seaweed used was the giant kelp that abounds on the Pacific coast. This was harvested by mechanical means, and cut up into very small pieces on board the harvester. The slurry of cut weed and water was pumped into a series of 150 tanks of capacity 50,000 gallons and there inoculated with a special culture. The fermentation proceeded quite regularly and at the end of a fortnight almost all the solid matter had gone into solution. The liquor was screened to remove solid matter, filtered, neutralised with lime, and the clear liquor evaporated in Kestner multiple evaporators. The first product of the evaporation was a thick plastic scum of calcium acetate, propionate, valerate, etc., which was removed and the salts immediately converted into the mixed ethyl esters which could be separated by distillation. The next substance to separate as the evaporation progressed was calcium acetate mixed with some potassium chloride. This mixture was removed and dry distilled for acetone.

Finally, some mention should be made of the possibility of manufacturing glycerin from sugary matters by fermentation. The yeasts of the sarcinae ellipsoideus group have been found to ferment a solution containing sucrose, phosphates, and sodium sulphite. Large scale experiments have shown that one ton of sugar will yield as much as 4 cwt. of glycerin and 5½ cwt. of alcohol, together with about 1 cwt. of mixed aldehydes.

Lead Bromate Explosions

AN inquiry has been held recently into a serious explosion which occurred in May, at the factory of E. de Haën, Seelze-bei-Hanover, Germany, in connection with the handling of lead bromate. It was stated that the substance was formerly prepared by the addition of lead carbonate to bromic acid. On this occasion, owing to lack of bromic acid, the lead bromate was prepared by the addition of a solution of lead acetate to one of potassium bromate, the precipitated lead bromate being filtered off and dried. A preliminary experiment having given satisfactory results, the preparation of a kilogram of the substance was begun. The precipitation, and the drying (carried out in an oven at 70° to 80° C.) proceeded normally, but when one of the chemists began to powder the product (apparently the whole kilogram) in a mortar, a loud and powerful explosion immediately occurred, killing him and fatally injuring a neighbouring worker. A concrete slab 5 cm. thick covering the bench was penetrated, a hole 50 cm. in diameter being formed. It is stated that a similar explosion, involving the death of the operator, occurred in the Chemische Fabrik Dr. Theodor Schuchardt G. m. b. H. in Görlitz, Germany, in December, 1924. In this case, lead bromate of similar origin was being powdered with a porcelain spatula in a stone basin.

"Smelters" to Make Sulphuric Acid

A PRESS report states that the Consolidated Mining and Smelting Co. of Canada will proceed immediately with the erection of a large contact process sulphuric acid plant. This plant will make sulphuric acid from the smelter fumes, and the first unit will cost approximately a quarter of a million dollars, according to an announcement by the management. In conjunction with this plant, an experimental phosphate fertiliser plant will be erected, using phosphate from the fields in the Crows Nest district, where the Consolidated Co. has located large beds. In the making of fertiliser, the phosphate would be treated with sulphuric acid, and with supplies of both at hand there is thought to be an excellent outlook for a large new industry for British Columbia.

Birmingham Corporation Gasworks

THE Birmingham Corporation gas committee state that last year's trading showed a surplus of £78,384. The coal carbonised during the year amounted to 695,178 tons, a decrease of 121,898 tons compared with 1925-26. Returns from the sale of residuals were :—tar, £146,777 9s. 2d.; coke and breeze, £507,457 16s. 4d.; ammoniacal liquor, £19,224 7s. 10d.; spent oxide, £11,180 12s. 2d.; sundry residual products, £262 12s. 4d. During the year, 8,154,559 gallons tar, and 27,913,283 gallons of ammoniacal liquor were sold.

Indian Chemical Notes

(From Our Indian Correspondent.)

With the growth of the Indian cement industry the imports of cement into India are steadily declining, though large development works are under construction and new projects started. The imports in 1924 were 114,000 tons, but in 1925 they declined to 106,000 tons and in 1926 still further to 99,000 tons. It is worthy of note that the decline has affected the United Kingdom only, imports from which went down from 98,000 tons in 1924 to 91,000 in 1925 and to 79,000 tons in 1926. Imports from Germany increased from 3,800 tons in 1925 to 5,000 tons in 1926, and those from Japan from 3,800 tons to 7,300 tons. Imports from other countries amounted to 7,700 tons and showed an increase during the year. No reason is yet apparent why the imports from the United Kingdom alone have suffered. In fact, the prices were easier than in 1925, and, besides, the prices of British cement compared favourably with those of other cements. The internal factor, namely, the Indian development, affects all foreign countries alike. It appears there has been little push by the British manufacturers.

At the annual meeting of the Bundi Portland Cement Co., Ltd., held in Bombay, the chairman expressed satisfaction at the results achieved, and remarked that the industry was slowly emerging from the period of depression through which it passed; if the same steady rate of progress was continued it would not be long before the demand for Indian cement equalled the productive capacity of the works now operating. The output of the company for the year 1926 showed an increase on that of the previous year, while the cost of production had again shown a further decline. The results were in part due to the maintenance of the plant and machinery in first-rate condition, and to the introduction of improvements and up-to-date methods, but mostly to the fact that the prices have been maintained at an economic level as the result of the formation of an association of the majority of cement companies in India, of which the Bundi Co. was a member. A 10 per cent. dividend was declared.

Artificial Silk Imports

The imports of artificial silk into India showed a large increase in the year 1926 as compared with 1925, and were valued at Rs. 356 lakhs as against 204 lakhs. Silk yarn increased from 2·3 million lb. to 4 million lb., but owing to a very heavy fall in prices, the value increased from 71 to 77 lakhs only. The largest quantity came from Italy, whose share increased from about 1 million lb. in 1925 to 2½ million lb. in 1926. The British share of the trade amounted to 436,000 lb. only. The United Kingdom, however, made considerable strides in the supply of piece goods mixed with cotton, and her share increased from 6·1 million yards to 14 million yards. The total imports into India from all countries were 36 million yards as against 13 million yards in the previous year. Italy comes very near the United Kingdom in this trade, and supplied 11 million yards as against 4 million yards in the previous year. Imports from Germany and Switzerland also increased very considerably.

Lac Research

Recent experiments in the department of biology of the Indian Institute of Science, Bangalore, indicate the possibility of growing lac as a garden crop. In Mysore an excellent plant for this purpose is *Acacia Farneciana*, which grows very readily, and which can be inoculated with lac after eighteen months from seed. There are also other plants which would prove useful for the purpose. Such a method of propagation would also render possible nurseries from which brood lac of first-rate quality, free from parasites, could be distributed to forest areas. The study of the methods of inoculation or infection of the trees showed that it was possible by careful adjustment of the quantity of brood to the number of twigs inoculated greatly to increase the resultant lac crop. There is every hope that if these and similar researches which are in progress are properly utilised by those who are in a position to grow lac in India, the uncertain and speculative character of the industry may be greatly diminished in the near future.

Paper-pulp Manufacture

The chief practical result of the experiments carried out in the paper-pulp section at the Forest Research Institute at Dehra Dun in the past year is the establishment, for bamboo, of the sulphate of soda method of digestion combined with fractional treatment. With it the chemical cost of digestion and bleaching has been reduced by over 40 per cent., and this discovery is having a profound effect on the prospects of bamboo pulping industry in India. Two manufacturing projects are now being seriously considered, one at Cuttack, in Bihar, and the other at Papanasam, in Madras.

The State of Bansda, in Kathiawar, has decided, after considerable experiments, to start the manufacture of paper pulp from bamboo grown in the State forests. The paper expert who was appointed some time ago to carry out the experiments has been able to manufacture a high quality of paper by the "soda" process, and certain very useful species of bamboo have been marked out for the purpose. By the "soda" process the expert has been able to show a distinct reduction in unit cost of the pulp. As there is ample market for paper in India, the new venture shows good signs of success.

Chemical Research in United Provinces

Among the most important investigations carried on at the Technical Laboratory and Institute at Cawnpore in the United Provinces, were the following: The manufacture of strychnine and brucine from *nux vomica*; the manufacture of a cheap newspaper printing ink; the variable tannin content of the Kumaun oak; the recovery of sugar from molasses; the preparation of camphor from pinene; the pinene content of Indian turpentine; the bleaching of shellac; the loss of sugar in open pan boiling; the vegetable oil industry in India; and attempts to prepare citral, geraniol, and similar open chain terpenes from turpentine, specially from Indian turpentine. Progress in the development of chemical industries, however, is slow. The most important chemical substance made in the province is sulphuric acid, but the quantity manufactured by the factories is small. The Research Laboratory gave assistance to a firm in the preparation of soda from sajji. A factory for the manufacture of tinctures has also been started under Government assistance.

The Chemical Trade

The important trade in chemicals in India in 1926-27 was worth Rs. 245 lakhs, as against Rs. 202 in the previous year. The imports of acids increased from 500 to 700 tons, bleaching powder from 3,000 to 4,000 tons, disinfectants remained stationary at 1,300 tons, and soda compounds increased from 72,000 tons to 87,000 tons. Magnesium, potassium, lead and zinc compounds all showed increases. Altogether, the year was a good one for the Indian trade.

Okha Salt Works

The foundation stone of the Okha Salt Works in the Baroda territories was recently laid. These works are being built for the supply of salt to Bengal and other markets. The works are laid out on modern lines with provision for the recovery of by-products. The production in the early stages will amount to about 75,000 tons annually. The works spread over 1,700 acres. The Baroda Government have granted valuable privileges to the company, whose selling agents in Bengal will be Volkart Brothers.

Artificial Manures in Bihar

Important developments are taking place in connection with the use of artificial manures in agriculture in the Province of Bihar and Orissa. Not only is there a serious deficiency of phosphates over a large part of Bihar, but the application of other kinds of artificial manures has been demonstrated to give excellent results. The demand for gypsum in Chota Nagpur and South Bihar, particularly the latter, where its use is becoming widespread, as also for sulphate of ammonia on account of its effect on vegetables and sugar-cane, is rapidly expanding, and Government have sanctioned a subsidy to several central banks for the employment of staff to supervise the supply of manures and seeds to members of co-operative societies. The campaign of organised propaganda now being inaugurated by a Calcutta firm for the popularisation and distribution of these manures seems likely to be followed by very important and far-reaching results, with great benefit to the agricultural classes, if the quality of the manures supplied to them is maintained. S. G. W.

Chemical Traders and Merchandise Marks

Note on Recent Board of Trade Order

In regard to the Board of Trade Order recently issued, stating that "Section 1 of the Merchandise Marks Act, 1926, shall not apply to uncompounded drugs from whatever source derived which are sold for medicinal purposes: provided that this Order shall not extend to any such drugs if sold or exposed for sale under a proprietary name," the British Chemical and Dyestuff Traders' Association, Ltd., makes the following comments, under date June 30:—

"It will be seen that the Order covers all classes of trade in the products covered by 'uncompounded drugs sold for medicinal purposes.' Originally it was proposed to limit the Order to such products 'sold to or by retail chemists.' This would not have covered the trade of the merchant importer. The Association put in an objection to this discrimination between classes of traders handling the same goods, and it is satisfactory to note the Order has been amended to meet our views. We have to-day asked the Board of Trade for a clear definition of 'uncompounded drugs,' showing what class of products it is intended to cover. Apparently, from information gained during discussions with officials of the department, it is intended to cover all pharmaceutical chemicals, excepting those sold under a proprietary name.

"Briefly 'drugs' may be interpreted as 'chemicals' sold for medicinal purposes. Therefore practically the whole of the 'fine chemical' trade is now free from liability to the marking provisions of Section 1 of the 1926 Act. Section 2 of the Act only operates after an Inquiry has been held and a Special Order in Council has been made to enforce the marking of a specified class of product. So far there has been no action in this way in regard to the chemical trade.

"It should be specially noted that this Exemption Order does not refer to the old M.M. Act of 1887, which operates at the time of importation of goods. Therefore foreign goods covered by this Order can be freely marked or labelled with the name of a British firm or in any other way to suggest they are of British origin after they are imported. If so marked before importation an indication of origin will be necessary under the 1887 Act, which can, after importation, be obliterated!

"Shipping Marks.—There is no further news about the promised Exemption, but it is likely to be issued in the near future. In the meantime there is no intention to enforce the recent ruling that the 'port of arrival' must be obliterated at the time of sale wholesale."

This Week's City Tour

The southern section of the Fleet Street neighbourhood was visited on Tuesday afternoon by the guests of the publishers of this journal on the third of the weekly City Tours. Led by Mr. Allen S. Walker, the party first visited St. Bride's, called the Printers' Church, and Mr. Walker made many interesting comments concerning this Fleet Street building. A short walk brought the party to Bridewell Place, where Mr. Walker showed the sites of Bridewell Prison, and the palace of Edward VI, the building now being occupied by the London City Mission, and then on to the offices of Bridewell Royal Hospital. Among the interesting oil paintings on the walls of the board room, Mr. Walker particularly showed one of William Benn, who was Lord Mayor of London in 1760, and who, he said, was probably connected with the family of publishers known by the visitors. Mr. Walker next took the party to Blackfriars Bridge to see where the underground River Fleet joined the Thames, but high tide prevented this being seen. From here the City of London School on Victoria Embankment was visited, and a tour was made of the Guildhall School of Music where rehearsals were proceeding. St. Bride's Institute was last of the buildings seen during the afternoon; here the famous printing library and ancient printing press were on view. The staff dining room at Bouverie House provided tea for the visitors. On Wednesday next, July 13, the fourth of the City tours will be made to the Royal Courts of Justice, the Record Office Museum (containing the Domesday Book), and Lincoln's Inn, while future visits will include Smithfield, St. Bartholomew's Hospital, Charterhouse, Central Criminal Courts, St. John's Priory Church, St. Paul's, etc. Parties assemble at Bouverie House at 2.45 p.m. Application should be made to the publishers of The Chemical Age.

Chemical Matters in Parliament

Beet Sugar Subsidy

In reply to Mr. Thurtle (House of Commons, June 29), Mr. Guinness said that the expenditure during the financial year ended March 31, 1927, in respect of subsidy on home grown beet sugar and molasses was £3,225,858. Of this amount approximately £1,004,300 was returned to the State in the form of Excise Duty.

Conveyance of Industrial Spirit

In answer to a question by Dr. G. C. Clayton (House of Commons, June 30), Mr. McNeill stated that Clause 12 of the Finance Bill would make it possible to allow, under suitable Regulations, spirits made or intended to be made into any kind of methylated spirits to be conveyed by tank wagon or pipe line. There was, however, no provision in the Bill under which such methods of conveyance of spirits which were neither methylated nor intended for methylation could be permitted.

Alcohol in Industry

In the course of an answer to questions by Sir Hilton Young and Commander Williams relating to Clause 12 of the Finance Bill (House of Commons Committee, June 30), Mr. Ronald McNeill stated that hitherto the regulation of the manufacture of spirits had been governed by the Spirits Act. That Act was placed on the Statute Book at a time when there was comparatively little use made of spirits for industrial manufacturing purposes. It was quite true that it was not by any means a modern habit to use spirits in industry, but the amount used until comparatively recently was inconsiderable; he thought about 4 per cent. of the total consumption. Now things had altered, and a very considerable use was being made of spirits for different forms of manufacture. There was reason to believe that there would soon be a much larger development of its use. If the Spirits Act, which imposed very strict regulations upon the production and the method of production of spirits, remained unmodified, it would be very hampering to the use of spirits for industrial purposes. Consequently, the Committee was being asked to give them much wider powers of discretion in regard to the use for industrial purposes of alcohol in its various forms, while safeguarding the revenue, of course, from any encroachment upon it when spirits are used as a beverage. The Committee was asked to give them this power in order that different forms of alcohol might be produced and handled, because one of the most difficult and restricted parts of the Act related to the handling of it. If this clause, with other clauses which have been introduced, would relieve industry from that burden he had no doubt the Committee would readily agree to it.

Colonial Research Service

In answer to a question by Captain Crookshank (House of Commons, July 4) as to whether any action was being taken towards creating a single Colonial scientific and research service, Mr. Amery stated that the committee of the Colonial Office Conference, over which Lord Lovat presided, while recommending the ultimate creation of a single Colonial research service, recognised that the natural method of growth of such a service was the organisation, in the first instance, of workers in the various fields of science into separate services. Mr. Amery further said he had appointed a committee to formulate practical proposals for submission to Colonial Governments to give effect to the resolution of the Colonial Office Conference.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

63 (*Arsenious Acid*).—"We are endeavouring to ascertain whether there is any firm in this country manufacturing arsenious acid from imported arsenical ore, and whose plant is equipped for the extraction of gold from the ore."

64 ("*Mulsoid*" *and* "*Lanoloid*.").—Do you know the name of the firm handling "Mulsoid" and "Lanoloid"?

From Week to Week

A NORTH-EAST COAST EXHIBITION will be held at Newcastle in 1929.

MR. A. C. B. MATTHEWS has been appointed to the staff of Naylor Brothers, Ltd.

DR. E. C. B. WILBRAHAM has taken up an appointment with the Pyrene Co., Ltd.

SIR ALEXANDER GIBB, president of the Institution of Chemical Engineers, has been appointed to the board of the Dunlop Rubber Co., Ltd.

RECENT WILLS INCLUDE: Mr. Edmund Cook, head of N. Cook and Son, chemical and salt merchants, of Redland, Bristol, £9,340 11s. 3d. (net personalty, £7,066 14s. 11d.).

PLANT FOR THE DISTILLATION OF COAL on a commercial scale is to be erected shortly at the pithead of the New Court Colliery, near Ashby-de-la-Zouch. The products will include oils, gas, and fuel.

FOAMITE FIREFOAM, LTD., of 24-26, Maddox Street, London, S.W.1, have, owing to expansion of business, changed their address to 55-57, Great Marlborough Street, London, S.W.1. (T. N.: Regent 3105/6/7.)

THE LAST ORDINARY MEETING of the Royal Society of Edinburgh for the present session was held on Monday, when the following were among those elected Honorary Fellows of the Society: Sir William Bragg and Professor Richard Willstätter.

MR. G. J. T. JEANS, of Wolsey, Ltd., Leicester, has been appointed to the post of sport and recreation administrator to I.C.I., and will organise the whole of the work in connection with the sports grounds and the sports and games for the 36,000 employees of the company.

ARRANGEMENTS HAVE NOW BEEN MADE for the installation of the first 100-ton "L. & N." coal distillation plant at the pithead of the new Loung Colliery, owned by the Leicestershire Colliery and Pipe Co. The plant will be erected in August and will be running continuously at the end of September.

BROWN AND SON (ALEMBIC WORKS), LTD., manufacturers of laboratory fittings and equipment, of Wedmore Street, Holloway, London, state that they have now available a new edition of their laboratory equipment catalogue, which may be obtained post free on request. The company has now completed the plant and machinery in an extension of its works, necessary to cope with increased business.

PROFESSOR HENRY LOUIS, of Newcastle, was appointed by the council of the Institution of Mining Engineers at their summer meeting at Newcastle, to succeed Dr. J. S. Haldane in the presidential chair at the annual meeting in London in November. Dr. Louis was professor in mining and metallurgy at the Armstrong College, Newcastle, from 1896 to 1923. On his retirement he was appointed secretary for the North of England Institute of Mining and Mechanical Engineers.

THE PRIVATE CONFERENCE of fuel technologists, to which reference was made in THE CHEMICAL AGE last week, gave detailed consideration to methods of the collective study of the fuel problems of England, France, Germany, and Australia. A basis for co-operative action has been reached, and, following a visit to Barnsley, arrangements were made for the early establishment of large-scale coal distillation plants in Great Britain, France, Germany, and Australia. The black and brown coal will not only be distilled, but the respective experts are to intensify research on the subsequent treatment of the by-products and residuals of coal.

INSTITUTE OF CHEMISTRY.—Arrangements are under consideration in connection with the jubilee of the Institute.—The Council proposes to repeat the procedure adopted in 1921, and to issue a questionnaire regarding the salaries and conditions of appointments of Associates and Fellows in whole-time appointments. The replies, which may be anonymous, will be collated and curves published showing the average salaries of such Fellows and Associates at various ages in different branches of work.—A contribution of £10 towards the expenses of the celebration of the Centenary of Marcelin Berthelot, which will take place in Paris in October, has been forwarded by the Council. Professor J. F. Thorpe, vice-president, has been appointed to represent the Institute on that occasion.

BEET SUGAR NEWS.—A resolution was passed at a special meeting of the Glasgow Corporation recently agreeing to petition the Government to take steps to deal with the position created by the operation of subsidies on beet sugar, preferential tariffs, and foreign dumping. It was pointed out that the effect upon sugar refining predicted in 1924, when a protest was made against the beet sugar proposals, had now come to pass, and only two of the five sugar refineries in Greenock were working. Unless something was done to combat the triple menace these two might also have to close.—Discussions are proceeding in Darlington with a view to the establishment of a beet sugar factory in the district. Many farmers in the neighbourhood have found the cultivation of sugar beet to be a paying proposition.

MAJOR F. A. FREETH, F.R.S., of I.C.I., has been elected a member of the Royal Institution.

MR. B. F. CONIGRAVE has joined the board of directors of the British Cyanide Co., Ltd.

MR. J. W. NAPIER has been appointed secretary for the Scottish District of the National Gas Council.

ILLUSTRATING THE BEGINNING AND DEVELOPMENT of the Indian firm of chemical and drug manufacturers, Butto, Kriste, Paul and Co., an interesting film was recently shown in London to the principals of the leading chemical firms of Great Britain.

MR. FRANK HODGES, who recently joined the board of L. and N. Coal Distillation, Ltd., has been appointed managing director of L. and N. Brown Coal, Ltd., which company is engaged in development of deposits of brown coal in various Australian States.

THE CASSEL CYANIDE CO. have circularised shareholders in regard to the offer made by Imperial Chemical Industries. The directors consider the offer to be entirely favourable. Further details will be found in the company news columns of this issue.

MR. E. C. POWELL, Assoc.Inst.P.T., announces that, in consequence of the termination of his lease at 39, Lombard Street, where he has been in business for the past 30 years, he has removed to 59, Gracechurch Street, a short distance away from his late offices. The telephone number remains the same.

A PARTY OF OIL ENGINEERING STUDENTS left Birmingham on Monday on a visit to the oilfields of Poland and Roumania, where a special vacation course has been arranged by the University authorities. The party is accompanied by Mr. L. P. Timmins, B.Sc., F.G.S., lecturer in the Department of Oil Engineering and Refining.

DR. T. DAVID JONES, M.Sc., M.E., has been awarded a medal by the National Association of Colliery Managers, for coal research, of which he has done much in the South Wales coalfields. Dr. Jones, who is a triple graduate of Birmingham University, is now engaged on research on spontaneous combustion in North Staffordshire.

THE WASEDA UNIVERSITY, TOKYO, has issued No. 4 (1927) of the Memoirs of its Faculty of Science and Engineering. The memoirs, covering 135 pages (printed in English), are mainly reprints of papers which originally appeared in the *Journal* of the Japanese Society of Chemical Industry, and form an impressive tribute to the activity of the research workers of the faculty. The number of papers is very large indeed, and the subjects dealt with touch on many aspects of pure and industrial chemistry.

UNIVERSITY NEWS.—Dr. Leslie Harris has been appointed director of the research institute which is shortly to be erected at Cambridge under the control of the Medical Research Council. Dr. Harris, two years ago, when only 26, was awarded the Meldola Medal by the Institute of Chemistry for research work. An old Liverpool College boy, he studied at Manchester University, where he took his D.Sc., and was a Leblanc medallist. He is a Ph.D. of Cambridge.—Sir E. J. Russell has had conferred on him the honorary degree of Doctor of Science of the University of Maryland.—At the conferment of degrees at the University of Leeds on Monday, Professor A. G. Perkin was invested with the degree of Doctor of Laws.—The honorary degree of Doctor of Science was conferred upon Sir Robert A. Hadfield and upon Professor Richard Willstätter at Oxford on Friday, July 1.—Mr. E. R. Jones, M.Sc., of Rhos, Wales, has received the Ph.D. degree of the University of North Wales for research work in chemistry.—On Saturday, July 2, at the Degree Congregation of the University of Birmingham, the Pro-Chancellor conferred the honorary degree of Doctor of Laws upon Professor Arthur Lapworth, F.R.S., Samuel Hall professor of chemistry, University of Manchester.—Mr. Wilfred Hugh, of Tenby, who has had conferred on him the degree of M.Sc. of the University of Wales, and has received an award of £250 per annum from the Department of Scientific and Industrial Research, will act as research assistant to Professor J. F. Thorpe, F.R.S., at the Royal College of Science, London. Mr. Hugh recently won the chief open science scholarship at Swansea College. Mr. J. A. V. Butler and Mr. H. A. Scarborough were successful candidates for the degree of Doctor of Science in the recent degree examinations at Birmingham University.

Obituary

MR. W. G. RICHARDS, recently, from typhoid fever, in his twenty-seventh year. A graduate of the Institution of Chemical Engineers, he carried out much research work in connection with ore dressing and concentration in Brazil, where he had been resident since 1919.

MR. JAMES DAVID KETTLE, at Croydon, on May 20, in his forty-eighth year. He was a Fellow of the Institute of Chemistry, and held the B.Sc. degree of the University of London. From 1903 to 1911 he assisted Dr. Alexander Scott and Sir James Dewar in research at the Davy Faraday Research Laboratory of the Royal Institution. He then joined the scientific staff of British Drug Houses, where he remained until 1921, in which year he was appointed Assistant Government Analyst at Trinidad. He was home on sick leave at the time of his death.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

271,533. Dyes and Dyeing. B. Wylam, J. E. G. Harris, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Scotland. Application date, January 21, 1926.

In Specifications 186,057 and 245,587 (see The Chemical Age, Vol. VII, p. 716 and Vol. XIV, p. 184A) is described the production of soluble derivatives of vat dyestuffs according to which the dry leuco compounds of the dyestuffs are treated with various esterifying agents such as chlorsulphonic acid. It is now found that similar derivatives can be prepared by treating aqueous vats of the dyestuffs, in the presence of a tertiary base, with an alkylsulphuric halide, oleum, sulphur trioxide, chlorsulphonic acid or the product obtained by interaction of one of these substances with pyridine. According to one example a concentrated flavanthrone vat is treated with pyridine and methylsulphuric acid chloride; on dilution a blue compound separates and may be dyed or printed on to cotton, the yellow shade of the flavanthrone being developed by hydrolysis and oxidation. Analogous compounds can be obtained from vats of thioindigo, indigo, indanthrone, anthraquinone-1 : 2-naphthacridone, and dibenzanthrone.

271,537. Dyes. W. Smith, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Scotland. Application date, January 26, 1926.

Flavanthrone or its derivatives are reduced by means of metal in strong sulphuric acid solution whereby hydro compounds are produced which are stable in air and can be washed and dried without special precautions to exclude air. In the presence of alkali air quickly oxidises them to the original dyestuffs. They may be used for the preparation of dye vats and printing pastes by addition of caustic alkali and a little reducing agent, together with the usual thickening materials, etc., but they are particularly suitable for direct conversion into water soluble derivatives by treatment with esterifying agents such as alkylsulphuric halides. According to an example flavanthrone or dichlorflavanthrone is dissolved in cold sulphuric acid, copper powder stirred in, and the acid diluted to 85 per cent. strength when the hydro compound crystallises out.

271,550. Dyeing Cellulose Esters. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 22, 1926.

Preparations for dyeing cellulose esters consist of mixtures of insoluble or difficultly soluble dyes (except vat dyes) with molasses; part of the latter may be replaced by waste sulphite cellulose liquor; protective colloids may also be present. Examples of such mixtures are aminoazobenzene and molasses, dinitrodiphenylamine, saponin, and molasses, 1 : 4 : 5 : 8-tetramino-anthraquinone, molasses, concentrated purified sulphite cellulose waste liquor, and sodium dicresyl phosphate. The pastes are used for dyeing after simple dilution with water.

271,564. Adsorbents, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 25, 1926.

Active adsorbents such as silica are usually purified by washing while in the form of the jelly obtained by precipitation. The last traces of impurities are difficult to remove, while if the jelly is dried before washing it is liable to crumble in contact with water owing to the withdrawal of soluble salts. It is now found that these difficulties can be obviated if the jellies are subjected to a short washing, then dried, and the last impurities removed by washing the shrunken mass. Examples are given of the treatment of the gels obtained by acidifying a sodium silicate or sodium tungstate solution. The preparation of active metal oxides such as alumina is also mentioned.

271,569. Dyes. C. H. Marschalk, 11, Rue de la Baume, Paris. Application date, February 26, 1926.

Vat dyestuffs are reduced to their leuco compounds in suspension in an anhydrous organic solvent by means of hydrogen in presence of a hydrogenation catalyst. The products being dry may be directly converted into esters. According to examples indigo suspended in dimethylaniline together with nickel-impregnated kieselguhr is treated with hydrogen at ordinary or elevated pressure at 90–100° C. The reaction mixture may be directly treated with chlorsulphonic acid for the preparation of the leuco indigo ester, the catalyst being eliminated during the subsequent operations.

271,580. Dyes. E. C. R. Marks, London. From E. I. Du Pont de Nemours and Co., Wilmington, Delaware, U.S.A. Application date, March 2, 1926.

Dyestuffs containing acid groups are converted into salts with arylguanidines, preferably by treating the dyestuffs (as alkali salts) with arylguanidine salts such as the acetates. The products are insoluble in water but are, unlike the alkali salts, readily soluble in organic solvents such as alcohol, acetone, ethylacetate, etc., and are therefore useful in colouring pyroxyline products and spirit varnishes. Examples are given of the production of salts from a number of acid azo, triphenylmethane, and eosine dyes, and diphenyl-, di-*o*-tolyl, di-*m*-xylyl-, and di-*o*-tolylphenyl guanidines.

271,589. Acetic Acid and Acetates, Manufacture of. Synthetic Ammonia and Nitrates, Ltd., P. A. Smith, and H. G. Smith, Billingham, Stockton-on-Tees. Application date, March 13, 1926.

Alkali acetates are obtained by reaction between methanol and sodium formate or between methanol, carbon monoxide, and caustic soda, or sodium carbonate. The sodium formate used may be the crude product obtained by the action of carbon monoxide on caustic soda. The methanol may be supplied in the form of vapour mixed with hydrogen and carbon monoxide as obtained in the catalytic synthesis of methanol. The sodium acetate may be distilled with sulphuric acid for the production of acetic acid. According to examples (1) sodium formate with a little water is treated at 250–300° C. with a stream of methanol vapour; (2) carbon monoxide or gas containing it is forced into an autoclave containing crude methanol and caustic soda or soda-ash until the pressure is about 50 atmospheres; the autoclave is then heated for two or three hours and the product worked up for sodium acetate or acetic acid.

271,602. Arylamino-anthraquinones. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, and A. Shepherdson, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, March 27, 1926.

Unsulphonated halogen anthraquinones are condensed with arylamines in presence of sufficient sodium acetate crystals to serve as a flux and to absorb the acid produced. For one part of halogen anthraquinone only one part of arylamine is necessary as compared with four parts necessary in the usual process, and, further, the small excess may be easily recovered. Thus 2 : 4-dibrom-1-aminoanthraquinone is heated with *p*-toluidine, copper acetate, and sodium acetate, poured into dilute hydrochloric acid, and the 1-amino-2-brom-4-*p*-toluidoanthraquinone purified by fractional precipitation from concentrated sulphuric acid; 1 : 5-di-*p*-toluidoanthraquinone is similarly obtained from 1 : 5-dichloranthraquinone.

271,725. Peroxides of Organic Acids. R. H. McKee, 210, Chrystie Heights Street, Leonia, Bergen County, New Jersey, U.S.A. Application date, October 26, 1926.

In producing peroxides of organic acids such as benzoyl peroxide, phthaloyl peroxide, and fumaroyl peroxide, from the acid chlorides and a solution of a peroxide, the yield is improved if the reaction is effected in presence of a material which will maintain the liquid neutral or only slightly alkaline; sodium bicarbonate and disodium phosphate are suitable. Thus phthaloyl chloride may be gradually mixed with hydrogen peroxide solution of 5 per cent. strength containing disodium phosphate, and the phthaloyl peroxide filtered off, washed, and dried at a low temperature.

(*Continued on page* 39)

(Continued from page 38)

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—244,463 (Badische Anilin und Soda Fabrik), relating to anthraquinone derivatives, see Vol. XIV, p. 185 ; 246,128 (I.G. Farbenindustrie Akt.-Ges.), relating to phosphoric acid, see Vol. XIV, p. 311 ; 247,217 (I.G. Farbenindustrie Akt.-Ges.), relating to carbon monoxide, see Vol. XIV, p. 386 ; 247,219 (I.G. Farbenindustrie Akt.-Ges.), relating to phosphorus, see Vol. XIV, p. 386 ; 249,884 (Soc. of Chemical Industry in Basle), relating to azo dyestuffs containing metal, see Vol. XIV, p. 578 ; 251,997 (I.G. Farbenindustrie Akt.-Ges)., relating to carbocyclic and heterocyclic compounds, see Vol. XV, p. 88 ; 252,390 (I.G. Farbenindustrie Akt.-Ges.), relating to dyestuffs, see Vol. XV, p. 141 ; 252,399 (Aktieselskapet Norsk Aluminium Co.), relating to aluminium oxide, see Vol. XV, p. 141 ; 254,708 (Soc. of Chemical Industry in Basle, relating to azo dyestuffs and chromium derivatives, see Vol. XV, p. 279 ; 257,917 (Soc. pour l'Exploitation des Procédés E. Urbain), relating to phosphorous or phosphoric acid and active charcoal, see Vol. XV, p. 501 ; 261,388 (K. Müller), relating to purification of nitrogen-hydrogen mixtures, see Vol. XVI, p. 91 ; 261,722 (California Cyanide Co., Inc.), relating to alkali cyanides, see Vol. XVI, p. 92 ; 261,747 (I.G. Farbenindustrie Akt.-Ges.), relating to amines of the cyclohexane series, see Vol. XVI, p. 121 ; 262,455 (I.G. Farbenindustrie Akt.-Ges.), relating to purification of hydrogen, see Vol. XVI, p. 167 ; 264,508 (Chemische Fabrik auf Actien. vorm. E. Schering), relating to chloriodo compounds of alpha-aminopyridine and its derivatives, see Vol. XVI, p. 317 ; 267,954 (H. Rupe), relating to unsaturated aldehydes, see Vol. XVI, p. 535.

International Specifications not yet Accepted

269,942. WETTING AGENTS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 23, 1926.

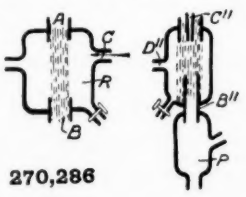
These consist of sulphonic acids of mineral oils such as solar oil, yellow oil, gas oil, paraffin oil, and the hydrocarbons obtainable from brown-coal tar, petroleum oil, and shale oil, but excluding coal tar oil ; they are preferably obtained by treating the oil, etc., with chlorsulphonic acid. They may be used in dyeing, bleaching, and destroying animal and plant pests, etc.

270,283. THYMOL AND CHLORTHYMOL. F. Raschig, Ludwigshafen-on-Rhine, Germany. International Convention date, April 29, 1926.

A chlorthymol (1-methyl-3-hydroxy-4-isopropyl-6-chlorbenzene) is obtained by condensing 1-methyl-3-hydroxy-6-chlorbenzene with isopropyl alcohol, for example in presence of sulphuric acid or zinc chloride. By heating in alkaline solution with iron it yields thymol.

270,286 and 270,287. SEPARATING GASEOUS MIXTURES. Urbain Corporation, 292, Madison Avenue, New York. International Convention dates, April 27, and May 1, 1926.

270,286. A gaseous mixture to be separated into its constituents is traversed by a jet of gas or vapour into which one



270,286

constituent will diffuse more quickly than the other and be carried away. In the figure the gaseous mixture enters a chamber R by a tube C and is traversed by a jet of water or mercury vapour which enters at A and leaves at B, carrying away the more easily diffused constituent ; or the mixture is injected into the stream of vapour at C^{II}, the more easily diffused constituent passing out of the stream and being delivered by the pipe D^{II} ; the vapour and remaining gases pass through B^{II} into the condenser P.

270,287. In this case the jet of vapour or gas contains very fine particles such as drops of condensed vapour or solid particles which may be previously activated, the constituent of the mixture having the greatest rate of diffusion and adsorption being carried away by the jet.

270,293. DISPERSING SOLID MATERIALS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 28, 1926.

In converting solid materials into a state of fine division or in producing them in such state, emulsifying agents, such as turkey red oil, soaps, trihydroxyethylamine, and alkylnaphthalenesulphonic acids, are used in conjunction with gelatinisable substances or water-soluble gums such as glue, casein, or gum arabic. Examples are given of the preparation of pigments and lakes in finely divided condition.

270,308. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 27, 1926.

Mordant dyestuffs for wool are obtained by coupling *o*-oxydiazo compounds with 2:6-dioxynaphthalene-3-carboxylic acid ; they yield fast olive-green to black shades by the single bath method.

270,339. SYNTHETIC DRUGS. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, April 30, 1926.

An α-halogen-quinoline-γ-carboxylic acid halide is treated with ammonia, a primary or secondary amine, or a derivative to obtain α-halogen-quinoline-γ-carboxylic acid amides. The halogen group of the product can be replaced by alkoxy or phenoxy groups by treating with an alcoholate, phenolate or derivative, or by amino or substituted amino groups by treating with ammonia, a primary or secondary base, or a derivative. The preparation of a large number of products is described.

270,348. SULPHUR DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, April 30, 1926. Addition to 199,360. (See THE CHEMICAL AGE, Vol. IX, p. 211.)

The indophenols obtained by condensing carbazol or an *N*-alkyl-carbazol, or mixtures with nitrosophenol, are sulphurised in the presence of urea and another aromatic base or derivative. Thus, carbazol and nitrosophenol are condensed and the product sulphurised by means of sodium polysulphide and sulphur. Urea and carbanilide are added, and the mass dried, baked, ground, and then extracted with dilute sodium sulphide and then with hydrochloric acid. The product dyes cotton blue.

270,349. EXTRACTING OILS. C. W. M. Bervoets, 15, Sabanroad, Bandoeng, Java. International Convention date, May 1, 1926.

Coal blocks are stacked in a closed concrete container, salt water added, and the temperature raised to 50° C. by steam pipes and then maintained by fermentation. Mineral oils are obtained.

270,351-2. DYES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 3, 1926.

270,351. Azo dyes suitable for cellulose esters and ethers are obtained by coupling a diazo compound of the benzene or naphthalene series or a homologue or substitution product free from sulpho, carboxyl, or hydroxyl groups with a *p*-substituted phenol free from sulpho and carboxyl groups, or with a homologue capable of being coupled in the *o*-position. Thus, diazotised *p*-amino-acetanilide may be coupled with *p*-cresol.

270,352. A yellow azo dye for cellulose acetate is obtained by coupling diazotised *p*-nitraniline with 1-nitro-2 : 4-diaminobenzene. A fast non-phototrope golden yellow shade is obtained.

270,626. PURIFYING OILS. Standard Development Co., 26, Broadway, New York. (Assignees of H. G. M. Fischer, 102, West Broad Street, Westfield, N.J., U.S.A., and W. J. Addems, 300, Westfield Avenue, Elizabeth, N.J., U.S.A.) International Convention date, May 8, 1926.

Sulphur is removed from liquid hydrocarbons by treating with sulphur in the presence of an alkali and a sulphide of lead or copper. The oil is then distilled up to 320° F. after treatment with sulphuric acid of 66° Bé, and the distillates treated with alkaline plumbite. The sulphur used may be

dissolved in hydrocarbon oils, or in alkali metal sulphides or polysulphides.

270,644. VULCANISING INDIARUBBER. Silesia Verein Chemischer Fabriken, Ida-und Marienhütte, near Saarau, Germany. International Convention date, May 4, 1926.

Rubber vulcanisation is accelerated by the use of salts of aliphatic or aromatic amines or their substitution products or derivatives. Salts of inorganic acids such as sulphates, chlorides, nitrites, sulphites, or thiosulphites are preferred. Ditolylguanidine thiosulphite is given as an example.

LATEST NOTIFICATIONS.

273,244. Process for the manufacture of hydro-aromatic dicarboxylic acids. Riedel Akt.-Ges., J. D. June 22, 1926.

273,247. Manufacture and production of new vat dyestuffs. I. G. Farbenindustrie Akt.-Ges. June 22, 1926.

273,261. Separation or recovery of a gas or vapour from a mixture of gases or vapours. Silica Gel Corporation. June 24, 1926.

273,263. Processes for the preparation of ethylsulphuric acid. Soc. Anon. Compagnie de Bethune. June 24, 1926.

273,276. Manufacture of esters of fatty acids and of mixtures containing fatty acids. Wecker, Dr. E. June 23, 1926.

273,279. Process for the manufacture of mixed alkaloid salts. Chemische Fabrik Auf Actien (vorm. E. Schering). June 26, 1926.

273,287. Production of white lead. Bailey, F. T., and Austin, W. June 22, 1926.

273,299. Manufacture of dyestuffs of the anthracene series. I. G. Farbenindustrie Akt.-Ges. June 24, 1926.

273,317. Process of saccharification of cellulose and similar materials (by percolation under pressure with diluted acids). Scholler, Dr. H. June 23, 1926.

273,321. Manufacture of cyclic ketones. I. G. Farbenindustrie Akt.-Ges. June 24, 1926.

273,324. Leather substitute. Du Pont de Nemours and Co. June 24, 1926.

273,337. Manufacture and production of valuable hydrocarbons from coal, tars, mineral oils, and the like. I. G. Farbenindustrie Akt.-Ges. June 26, 1926.

273,342. Process of preparing alkyl ethers of 3¹-nitro 4¹-hydroxy-ortho benzoyl benzoic acid. Newport Co. June 28, 1926.

Specifications Accepted with Date of Application

247,582-3-4-5-6-7, 272,829 to 272,835. Liquid or other hydrocarbons and derivatives thereof from coal and other like materials, or from products extracted or distilled from coal and the like, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 14 and 16, 1925, and February 11, 1926. 247,585 addition to 247,584, 247,586 addition to 247,583, and 247,587 addition to 247,582.

247,588. Emulsions, Process for preparing. I.G. Farbenindustrie Akt.-Ges., February 11, 1925.

247,941. Highly valuable cast iron with the finest distribution of graphite, Process for the manufacture of. Gelsenkirchener Bergwerks Akt.-Ges. February 21, 1925.

248,766. Azo dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 5, 1925. Addition to 231,529.

249,519. Liquid hydrocarbons and other organic bodies from heavy organic materials, Production of. G. Patart. March 21, 1925.

250,948. Hydrocarbons and derivatives thereof from mineral oils, bitumens, and the like, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. April 15, 1925. Addition to 247,582.

252,713. Alcohols and other oxygenated organic compounds, Process for preparing catalytically. L. Casale. May 28, 1925.

253,118. Substituted aromatic sulphonic acids, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 2, 1925.

255,429. Extraction of crystals from anthracene, naphthalene, and like distillates of coal tar, Method of and apparatus for. A. Meiro. July 15, 1925.

254,302. Oxidation of magnesium and its alloys, Process for preventing. I.G. Farbenindustrie Akt.-Ges. June 24, 1925.

254,713. Destructive hydrogenation of coal, tar, mineral oils, and the like. I.G. Farbenindustrie Akt.-Ges. July 2, 1925.

259,188. Zinc from zinc-iron-silicious slags, Process for the extraction of. E. Alberti, H. Thielmann, M. Begas, R. Alberti, and K. Alberti. September 29, 1925.

260,225 and 264,520. Phosphorus, phosphoric oxides and phosphoric acid, Process for the production of. I.G. Farbenindustrie Akt. Ges. October 22, 1925, and January 15, 1926.

264,865. Electrolysing solutions of alkali metal chlorides, Apparatus for. E. Krebs. January 23, 1926.

267,974. Distillation of coal tar, tar oils, and similar liquids, Method and apparatus for. A. Meiro. March 2, 1926.

268,316. Metallic magnesium, Process for the production of. M. N. Lacell. March 26, 1926.

262,075. Cobaltous acetate, Process for the production of. I.G. Farbenindustrie Akt.-Ges. November 27, 1925.

272,567. Dioxydiamino-arsenobenzene, Manufacture of solution of derivatives of. S. R. Macewen. December 17, 1925.

272,580. Azo-dyestuffs, Manufacture of. O. Y. Imray, London. (*I.G. Farbenindustrie Akt.-Ges.*) March 9, 1926.

272,597. Recovery of antimony in the manufacture of flavanthrone. E. C. R. Marks. (*E. I. Du Pont de Nemours and Co.*) March 15, 1926.

272,641. Stills or columns for the distillation of ammonia. W. T. Towler and R. Marsh. March 29, 1926.

272,686. Salts of amino-guanidine or amino-alkylene-guanidines, Process for the production of. M. Heyn. June 18, 1926.

272,706. Aluminium alloys. A. L. Mond. (*T. Goldschmidt Akt.-Ges.*) July 26, 1926.

272,733. Metal compounds, Process of producing. A. F. Meyerhofer. June 7, 1926. Addition to 253,150.

272,748. Alumina, Process for the production of. A. L. Mond. (*I.G. Farbenindustrie Akt.-Ges.*) October 20, 1926.

272,766. Vertical retort for the extraction of oil from bituminous solid fuels such as shale, coal, peat, and the like. G. Menell. November 20, 1926.

Applications for Patents

Ammonia Casale Soc. Anon., and Dicker, S. G. S. Closure for tubes containing fluids under pressure. 17,296. June 29.

British Celanese, Ltd. Manufacture of cellulose derivatives. 17,523. July 1. (United States, July 2, 1926.)

British Celanese, Ltd. Treatment of fabrics containing threads of cellulose derivatives. 17,524. July 1. (United States, July 8, 1926.)

British Celanese, Ltd. Application of cellulose esters, etc. 17,525. July 1. (United States, July 23, 1926.)

British Research Association for the Woollen and Worsted Industries. Apparatus for colour estimation. 17,165. June 28.

Caro, N., and Frank, A. Nitric acid. 17,220. June 28. (Germany, June 29, 1926.)

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of hydrogen peroxide. 17,468. June 30.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of carboxylic acids. 17,573. July 1.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 17,574. July 1.

Chloride Electrical Storage Co., Ltd. Manufacture of lead oxide. 17,078. June 27.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of vat dyestuffs. 17,091. June 27.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of unsaturated aliphatic hydrocarbons. 17,094. June 27.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of highly-active adsorbents. 17,095. June 27.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Purification of gases, etc. 17,097. June 27.

I. G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Manufacture of derivatives of the triarylmethane series. 17,280. June 29.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Treatment of exhaust gases. 17,291. June 29.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of ammonium phosphates. 17,292. June 29.

I. G. Farbenindustrie Akt.-Ges. and Johnson J. Y. Alloys. 17,449. June 30.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of paraformaldehyde. 17,553. July 1.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of dyestuffs. 17,574. July 1.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of lactic acid. 17,623. July 2.

I. G. Farbenindustrie Akt.-Ges. Manufacture of hydrocarbons. 17,092. June 27. (Germany, June 26, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of liquid products from coal, etc. 17,093. June 27. (Germany, June 29, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of wide porous active silica. 17,096. June 27.

I. G. Farbenindustrie Akt.-Ges. Photographic films. 17,102. June 27. (Germany, September 9, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of benzanthrone condensation products, etc. 17,293. June 29. (May 4.)

I. G. Farbenindustrie Akt.-Ges. Production of aqueous solutions of organic compounds insoluble in water. 17,622. July 2. (Germany, July 2, 1926.)

Imperial Chemical Industries, Ltd., and Littlebury, W. O. Manufacture of fuse heads for electrical firing. 17,316. June 29.

Mallabar, H. J., and Non-Inflammable Film Co., Ltd. Manufacture of cellulose ester, etc., sheets. 17,045. June 27.

Newport Co. Process of preparing alkyl ethers of 3¹-nitro 4¹-hydroxy-ortho benzoyl benzoic acid. 17,201. June 28. (United States, June 28, 1926.)

Ruzicka, C., and Shuttleworth, J. W. W. Manufacture of acetic anhydride, etc. 17,577. July 1.

Turner, W. Dyeing-machines, etc. 17,226. June 28.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton for home market, 1-cwt. drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—8d. to 9d. per lb. Crude 60's, 2s. 6d. to 2s. 8d. per gall.

ACID CRESYLIC 99/100.—2s. 8d. to 2s. 9d. per gall. 97/99.—2s. 1½d. to 2s. 3d. per gall. Pale, 95%, 2s. to 2s. 1½d. per gall. Dark, 1s. 9d. to 1s. 10d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 11d. to 1s. per gall., ex works in tank wagons. Standard Motor, 1s. 9d. to 2s. 2d. per gall., ex works in tank wagons. Pure, 1s. 7d. to 2s. 6d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 8d. to 1s. 10½d. per gall. Firm. Pure, 2s. to 2s. 3½d. per gall.

XYLOL.—1s. 11d. to 2s. 4d. per gall. Pure, 2s. 6d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8½d. to 8¾d. per gall. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 7½d. to 8d. per gall. according to quality. Solvent 90/160, 1s. 5d. to 1s. 6d. per gall. Solvent 95/160, 1s. 5d. to 1s. 6d. per gall. Solvent 90/190, 11d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £7 10s. per ton. Whizzed or hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £13 10s. per ton. Quiet. Flaked, £12 10s. per ton, according to districts.

PITCH.—Medium soft, 77s. 6d. to 85s. per ton, f.o.b., according to district; nominal.

PYRIDINE.—90/140, 7s. 6d. to 13s. per gall. Nominal. 90/180, 4s. 6d. to 5s. per gall. Heavy, 5s. to 8s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7½d. per lb. naked at works.

ANILINE SALTS.—7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4¼d. per lb. Fair inquiry.

m-CRESOL 98/100%.—3s. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8¾d. per lb. Only limited inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 2d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 10s. to £9 5s. per ton. Grey, £15 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£6 15s. to £10 per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 9d. to 4s. per gall., 60% O.P. Solvent, 3s. 11d. to 4s. 3d. per gall., 40% O.P.

WOOD TAR.—£4 to £5 10s. per ton and upwards, according to grade

BROWN SUGAR OF LEAD.—£40 15s. to £41 10s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 6d. per lb.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.

ACID, BORIC B.P.—5 cwt. lots Crystal, 41s. per cwt.; powder, 45s. per cwt. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 7¾d. to 1s. 10d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P.—1s. 4d. per lb.; Technical.—11½d. to 1s. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 3¾d. per lb., less 5%. Firm market.
AMIDOL.—9s. per lb., d/d.
ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—8s 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: 1s. per lb.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. to 10s. per lb.
BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.
BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.
BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.
BISMUTH NITRATE.—5s. 9d. to 6s. per lb.
BISMUTH OXIDE.—13s. 9d. to 14s. per lb.
BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.
BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb; 36 W. Qts. 11½d. per lb.
BORAX B.P.—5 cwt. lots, Crystal, 25s. per cwt.; powder, 27s. per cwt. according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 10d. to 1s. 11d. per lb.; sodium, 2s. 2d. to 2s. 4d. per lb.; ammonium, 2s. 3d. to 2s. 4d. per lb., all spot.
CALCIUM LACTATE.—1s. 3½d.
CHLORAL HYDRATE.—3s. 6d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—Prices for Winchester quarts; dozen Winchester quarts; carboys or drums; and 10 cwt. lots respectively: ·730—1s. 2½d.; 1s. 2d.; 1s. 1½d.; 1s. 0½d.; ·720 technical—1s. 5½d.; 1s. 5d.; 1s. 4½d.; 1s. 3½d.; ·720 pur. (Aether B.P., 1914)—2s. 4d.; 2s. 3½d.; 2s. 3d.; 2s. 2d.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—5s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 1 lb., 16s. per doz.; ½ lb., 9s. 6d. per doz.; ¼ lb., 6s. 6d. per doz. 10 VOLS.—2s. 3d. to 2s. 11d. per lb., according to quantity and package.
HYDROQUINONE.—2s. 11d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
IRON PERCHLORIDE.—4d. per lb., 22s. per cwt., according to quantity.
MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy Commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 18s. 6d. per lb. net; Synthetic detached crystals, 11s. 6d. to 14s. 6d. per lb., according to quantity; Liquid (95%), 12s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 6d. to 1s. 8d. per lb.
METHYL SULPHONAL.—9s. 6d. to 9s. 9d. per lb.
METOL.—11s. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 2d. to 1s. 4d. per lb.
PHENACETIN.—2s. 9d. to 3s. per lb.
PHENAZONE.—4s. 3d. to 4s. 6d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—100s. per cwt. less 2½% for ton lots.
POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt lots.
POTASSIUM IODIDE.—16s. 8d. per lb. for 1 cwt. lots.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.
QUININE SULPHATE.—2s. per oz., 1s. 8d. to 1s. 9d. for 1000 oz. lots in 100 oz. tins.
RESORCIN.—3s. 9d. to 4s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 97s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. to 2s. 2d. per lb.
THYMOL.—Puriss., 10s. 3d. to 11s. 6d. per lb., according to quantity. Firmer. Natural, 15s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. 3d. per lb.
AUBEPINE (EX ANETHOL), 10s. 6d. per lb.
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—5s. 3d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—17s. per lb.
COUMARIN.—10s. per lb.
CITRONELLOL.—14s. 6d. per lb.
CITRAL.—8s. 9d. per lb.
ETHYL CINNAMATE.—7s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. per lb.
GERANIOL (PALMAROSA).—17s. 6d. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 18s. per lb. Ex Shui Oil, 14s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb
METHYL BENZOATE.—4s. 6d. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—8s. 6d. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—10s. 6d. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—32s. 6d. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—17s. to 18s. 6d. per lb. Good demand.

Essential Oils

ALMOND OIL.—10s. 3d. per lb.
ANISE OIL.—3s. 1d. per lb.
BERGAMOT OIL.—28s. 6d. per lb.
BOURBON GERANIUM OIL.—14s. 9d. per lb.
CAMPHOR OIL.—67s. 6d. per cwt.
CANANGA OIL, JAVA.—26s. per lb.
CINNAMON OIL LEAF.—6d. per oz.
CASSIA OIL, 80/85%.—8s. 3d. per lb.
CITRONELLA OIL.—Java, 85/90%, 1s. 11d. per lb. Ceylon, pure, 1s. 9d. per lb.
CLOVE OIL.—6s. per lb.
EUCALYPTUS OIL, 70/75%.—2s. 3d. per lb.; 75/80%, 2s. 4d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 21s. per lb.
LEMON OIL.—8s. per lb.
LEMONGRASS OIL.—4s. 6d. per lb.
ORANGE OIL, SWEET.—10s. 6d. per lb.
OTTO OF ROSE OIL.—Anatolian, 30s. per oz. Bulgarian, 70s. per oz.
PALMA ROSA OIL.—10s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 18s. per lb. Japanese, 8s. per lb.
PETITGRAIN OIL.—7s. 6d. per lb.
SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95% 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, July 6, 1927.

QUITE a fair volume of business has been in evidence this week, and buyers appear to be showing greater confidence in placing their orders for later deliveries. Prices on the whole are firm. Export business is still inclined to be slow, although there are indications that demand is improving, especially from the Far East.

General Chemicals

ACETONE is maintained at about £63 per ton, with demand fair.

ACID ACETIC shows no change in price at £37 to £38 for 80% technical, and has a satisfactory demand.

ACID CITRIC is still quoted at 1s. 7½d., less 5%, and is in better demand.

ACID FORMIC.—Demand fair without change in price, which still holds at about £48 for 85%.

ACID LACTIC.—A satisfactory business is being done in this product, and price is firm at £42 for 50% weight technical.

ACID OXALIC.—Rather dull, but price unchanged at £28 to £30 per ton.

ACID TARTARIC.—Demand improving and price is firmly held at 1s. 3½d. to 1s. 4d., less 5%.

ALUMINA SULPHATE is in good request, and price firm at £5 10s. to £6 per ton for 17/18%.

AMMONIUM CHLORIDE is rather dull, but price is maintained at about £10 for fine white 98/100% quality.

ARSENIC.—Little business is offering here, but price shows no further weakening at £15 10s. to £16 at mines.

BARIUM CHLORIDE.—Demand rather less, but price is held at about £9 for spot material.

COPPER SULPHATE.—With the seasonal trade ending demand is drooping, but price shows very little change at £23 to £23 10s. for good quality brands.

CREAM OF TARTAR.—Demand is fair with price a shade easier at about £100 for best makes.

EPSOM SALTS.—Rather scarce on the spot and for near delivery. Price firmer and may go higher. Small lots offering at about £5.

FORMALDEHYDE is in better request and price steady at £40 to £41 per ton for spot.

LEAD ACETATE.—Slight adjustments in price in accordance with metal prices have been made, but demand is quite good and spot stocks are offering at about £43.

LEAD NITRATE.—Demand fair at £38 to £39 per ton.

METHYL ACETONE is firmer and in good request. Price for spot material about £62 for best quality.

POTASSIUM CHLORATE.—Export demand increasing and price for forward inclined to harden, spot supplies offering at about 3¼d. per lb.

POTASSIUM PERMANGANATE is unchanged at about 7½d. per lb.

POTASSIUM PRUSSIATE.—A good inquiry is in evidence, especially for forward business, and there is also a brisk demand for spot material. Price shows no further change.

SODIUM ACETATE is improving in demand and spot supplies are offering at £18 15s. to £19 per ton.

SODIUM BICHROMATE is in good request at standard prices.

SODIUM CHLORATE in good request, and the recent reduction has stimulated demand.

SODIUM HYPOSULPHITE.—Foreign material inclined to be firmer owing to large export demand. English maker's prices unchanged.

SODIUM NITRITE is in fair request and quoted unchanged at about £20.

SODIUM PHOSPHATE is in brisk demand at £12 per ton.

SODIUM PRUSSIATE.—Price continues firm, and demand quite satisfactory.

SODIUM SULPHIDE is quiet, especially on export account; price, however, is unchanged.

ZINC SULPHATE is in fair demand at about £12 per ton for best quality.

Coal Tar Products

The market values of coal tar products continue practically unchanged, and there is little business passing.

90's BENZOL.—There is very little demand, and it is quoted at 1s. 2½d. to 1s. 3d. per gallon, on rails, while the motor quality can be bought at 1s. 2d. per gallon.

PURE BENZOL is worth about 1s. 8d. to 1s. 9d. per gallon, on rails.

CREOSOTE OIL is firm for spot delivery, the price, on rails, in the North, being 7¼d. per gallon, while the price in London is 8¾d. to 9d. per gallon.

CRESYLIC ACID remains firm, and the pale quality, 97/99%, is very scarce for prompt delivery. It is quoted at 2s. 3d. to 2s. 4d. per gallon, on rails, while the dark quality, 95/97%, is worth about 1s. 10d. per gallon.

SOLVENT NAPHTHA is unchanged from last week, and is worth about 10½d. to 11d. per gallon.

HEAVY NAPHTHA can be bought at 11d. per gallon, on rails.

NAPHTHALENES.—There is a better demand for the 74/76 quality, and prices tend to become firmer, at about £6 10s. per ton. The 76/78 quality is still quoted at £8 to £8 10s. per ton.

PITCH.—There is very little change to report, but there seems to be more interest shown for the forward position, and prices are well maintained at about 80s. to 85s. f.o.b.

Latest Oil Prices

LONDON, July 6.—LINSEED OIL dull and 5s. to 12s. 6d. lower. Spot, ex mill, £32 15s.; July, £31 12s. 6d.; July to August, £31 15s.; September to December, £32 10s. RAPE OIL slow. Crude, extracted, £43; technical refined, £45, naked, ex wharf. COTTON OIL quiet. Refined common, edible, £41 10s.; Egyptian, crude, £35 10s.; deodorised, £43 10s. TURPENTINE firm and 9d. to 1s. per cwt. higher. American, spot, 37s. 9d.; August, 38s. 3d.; September to December, 39s. 9d. per cwt

HULL, July 6.—LINSEED OIL.—Spot to December, £32 15s. per ton, naked. COTTON OIL.—Egyptian crude, £34 15s.; edible refined, £39; technical, £38; deodorised, £41 per ton, naked. PALM KERNEL OIL.—Crushed, 5½ per cent., £37 5s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, £43 10s.; deodorised, £47 10s. SOYA OIL.—Extracted and crushed, £33 5s.; deodorised, £36 15s. RAPE OIL.—Crude-extracted, £43; refined, £45 per ton, net cash terms, ex mill. CASTOR OIL and COD OIL.—Unaltered.

Nitrogen Products

Export.—During the last week the market for sulphate of ammonia has been quiet, with a downward tendency. It is reported that large lots have been sold at the price of £9 2s. 6d. per ton, f.o.b. U.K. ports, in single bags. This is no doubt due to the indications of increased production which have made themselves manifest in several countries.

Home.—British producers have now announced that there will be a big cut in prices for August delivery and onwards. Nevertheless, there is a demand for sulphate of ammonia for immediate consumption in certain parts of the country, and small sales are taking place at the present price of £12 6s. per ton for neutral quality.

Nitrate of Soda.—The half-yearly reports of Messrs. Aikman and Henry Bath have now been circulated. They show very clearly a decline in consumption, and attribute this to the high price policy of the Producers' Association. These reports show that the big cut in prices for the season 1927-8 have already resulted in large sales. The accumulation of heavy stocks at the beginning of the year resulted in a reduction of production, but further oficinas are now reopening, and it is anticipated that the coming month will show a regular increase.

The relations between the Nitrate Producers and the Chilian Government show that the latter have adopted a more sympathetic tone, and indicate that, although at the moment nothing can be done for the present year, at some future period the export tax may be reduced. The tone of these circulars conveys a note of optimism, but with reservations. It will undoubtedly take a Herculean effort to recover the ground lost during the last two or three years.

Sheffield University: New Mining Department

SHEFFIELD University, it is expected, will have in the very near future a new mining department at a cost of somewhere in the region of £24,000. It is believed plans are very near completion, and in a short time the University will have one of the finest mining departments in the country, and be able to provide for the advanced education of men connected with the mining industry, in addition to research work. The site for the new department is expected to adjoin the present building and, when completed, will cost about £21,000, while over £3,000 will be expended on equipment. The proposal for the establishment of the new department arose three years ago when the central committee of the Miners' Welfare Fund promised £8,000 towards the cost of a new department on condition that a like sum was raised locally. By the aid of subscriptions from local collieries and the South Yorkshire Coal Owners' Association (who give considerably towards the present mining and fuel departments of the University), the sum was raised, and the sum now available for the building is over £17,000. There is ground for believing that the scheme is sufficiently ripe, and that work will begin shortly.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, July 6, 1927.

DURING the past week business in the heavy chemical market has been rather quieter, one or two local holidays being mainly responsible. Prices show little or no change from those last reported.

Industrial Chemicals

ACID ACETIC.—98/100%, £55 to £67 per ton, according to quantity and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powdor, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand and price unchanged at about 8½d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Rather quieter but prices maintained at about 1s. 6½d. per lb., less 5%, ex store, for English material and 1s. 7d. per lb., less 5%, ex wharf, for continental.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80°.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC.—Still in good demand and price unchanged at 3d. per lb., ex store, spot delivery. Offered from the Continent at 2¾d. per lb., ex wharf.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Price about 1s. 3¾d. per lb., less 5%, ex wharf, in fairly good demand.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality on offer from the Continent at £8 2s. 6d. per ton, c.i.f., U.K. ports; powdered, 2s. 6d. per ton less. Lump on spot on offer at £9 2s. 6d. per ton, ex store.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture quoted £23 to £24 per ton, ex station. Continental material on offer at about £19 15s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £18 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material unchanged at about £18 15s. per ton, ex store. Offered for prompt despatch from mines at £17 10s. per ton, ex wharf.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £7 2s. 6d. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4-ton lots. Spot material, 10s. per ton extra. Continental on offer at £7 10s. per ton, ex wharf.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 to £5 5s. per ton, ex station, with a slight concession for contracts. Continental quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Continental material cheaper at about £24 per ton, c.i.f. U.K. ports. British material on offer at £24 10s. per ton, f.o.b. nearest port.

FORMALDEHYDE, 40%.—Unchanged at £38 per ton, c.i.f. U.K. ports, spot material quoted £39 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material now on offer at £31 15s. per ton, ex store.

LEAD, WHITE.—Quoted £32 5s. per ton, ex store.

LEAD ACETATE.—White crystals offered from the Continent at £42 7s. 6d. per ton, c.i.f. U.K. ports; brown, about £40 5s. per ton, c.i.f. U.K. ports; white crystals offered on spot at about £43 15s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

POTASH, CAUSTIC, 88/92%.—Solid quality quoted £28 15s. per ton, c.i.f. U.K. ports, minimum 15-ton lots. Under 15-ton lots, £29 10s. per ton. Liquid, £15 per ton, minimum 15-ton lots. Under 15-ton lots, £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Quoted £27 5s. per ton, ex wharf, early shipment. Spot material on offer at about £28 10s. per ton, ex store.

POTASSIUM CHLORATE.—Powdered quality on offer at £24 5s. per ton, c.i.f. U.K. ports. Crystals, £2 per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 12s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £21 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Rather easier at about 7¼d. per lb., ex store, spot delivery. Offered for prompt shipment at a fraction less.

SODA CAUSTIC.—Powder, 98-99 %, £19 7s. 6d. per ton; 76-77%, £15 10s. per ton, and 70-72%, £14 10s. per ton, carriage paid station; minimum 4-ton lots on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 per ton, ex store. Continental rather higher at about £17 17s. 6d. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex store; minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals of English manufacture quoted £15 5s. per ton, ex station, 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 15s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—Offered for prompt shipment from the Continent at 4¼d. per lb., ex wharf, spot material on offer at 4½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—Prices for English material as follows: 60-65% solid now £10 10s. per ton; broken, £11 10s. per ton; flake, £13 5s. per ton; crystals, 31-34%, £7 10s. per ton to £8 5s. per ton, according to quality, delivered your works, minimum 4-ton lots on contract. Prices for spot delivery 5s. per ton higher for solid, 2s. 6d. per ton for crystals. Offered from the Continent at about £9 5s. per ton, c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 per ton; rock, £11 per ton; floristella, £10 per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98-100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98-100%, solid, on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Intermediates

H. ACID.—3s. per lb., per 100%. Small inquiries.

DIMETHYLANILINE.—1s. 11d. per lb. Some inquiries.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. Some inquiries.

J. ACID.—5s. 6d. per lb. Some inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some inquiries.

Accident in Oxygen Receiver

Two men lost their lives in an oxygen receiver belonging to the Liquid Air Co., on the premises of the Bolton Superheater Works, Adswood, Stockport, on Friday, July 1. The men were engaged at the works in connection with a liquid air blast, and entered the receiver by the manhole; shortly afterwards smoke was seen to rise from it. A hole had to be cut in the side of the receiver before entry could be effected. No explanation can be given as to the cause of the accident. The receiver was emptied of oxygen the night before, and was thought to be clear. The bodies when brought out were charred beyond recognition.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, July 7, 1927.

Home trade buyers of chemical products seem to have displayed somewhat more interest on the Manchester market this week, to the extent of inquiry, at all events, even if the actual orders placed have not been on a much better scale than during the past few weeks. The demand on export account continues rather slow, and this branch of trade on this centre presents few important features.

Heavy Chemicals

There has been no change in the position of bleaching powder since last report, a quietly steady trade being done at makers' price of £8 per ton. Glauber salts are nominally steady at from £3 5s. to £3 10s. per ton, but the demand for this product keeps within moderate limits. The tendency in the case of chlorate of soda is easy at about 2¾d. per lb., and interest has been slow. Bichromate of soda meets with a fair demand, and values are steady in the neighbourhood of 3d. per lb. As regards caustic soda, prices in this section are firm at from £14 10s. to £16 10s. per ton, according to quality, and a steady trade is being put through. Prussiate of soda is in moderate request, with current offers ranging from 4⅝d. to 4¾d. per lb. Only a quiet business is passing in hyposulphite of soda, but quotations show little change on the week, photographic still being available at from £15 5s. to £15 10s. per ton, and the commercial product at about £9 10s. A moderate trade is being done in nitrite of soda at £19 per ton. Buying interest in sulphide of soda remains at a relatively low level, with the 60-65 per cent. concentrated solid quality on offer at £11 to £11 5s. per ton, and the commercial at round £8 7s. 6d. Saltcake is about maintained at £3 15s. per ton, and a quiet business in this has been reported. Bicarbonate of soda is attracting a fair amount of attention from both home and export buyers, and prices are steady at about £10 10s. per ton. Phosphate of soda remains on the slow side at £12 15s. per ton. For alkali the demand keeps fairly good at firm prices, round £6 15s. per ton still being quoted here.

In spite of a continued quiet demand permanganate of potash keeps steady at 6½d. per lb. for the B.P. material and about 5½d. for the commercial. Carbonate of potash is current quoted at from £27 5s. to £27 10s. per ton, and a moderate business in this has been reported during the week. Caustic potash attracts a fair amount of buying interest at £30 10s. to £31 per ton. Yellow prussiate of potash continues quiet and easy at 6⅝d. per lb. Bichromate of potash meets with some inquiry and round 4⅛d. per lb. is being quoted. So far as chlorate of potash is concerned, the position is much what it was a week ago; the demand for this is of limited dimensions and at 3d. to 3¼d. per lb. the tendency is easy.

Sulphate of copper is well held at £25 10s. per ton, f.o.b., and inquiry in this section of the market remains pretty good. Down to £15 5s. per ton at the mines is being quoted in some cases for white powdered arsenic, Cornish makes, but buying interest in this shows little real improvement. Acetate of lime is not too plentiful, and prices are steady at about £15 10s. per ton for grey and £8 5s. to £8 10s. for brown. Nitrate of lead meets with some inquiry at £38 per ton. Acetate of lead is rather quiet and easy at £40 10s. to £41 per ton for brown and about £43 for the white material.

Acids and Tar Products

Values in the acid section are steady to firm pretty well all round. In neither citric nor tartaric acid is there much business stirring at the moment, but values are firm at 1s. 6¾d. and 1s. 3¼d. per lb., respectively. Oxalic acid is maintained at about 3d. per lb. and attracts a moderate amount of attention. Acetic acid continues in fair demand at £66 to £67 per ton for the glacial and about £37 per ton for the 80 per cent. commercial quality.

Among the by-products solvent naphtha is weak and extremely inactive at 1s. 1d. to 1s. 2d. per gallon. Creosote oil keeps firm at about 7½d. per gallon and inquiry for this remains fairly good. Pitch continues steady on relatively short supplies at £4 2s. 6d. to £4 5s. per ton. There is not a great deal of actual business passing in carbolic acid, but values keep up at about 8d. per lb. for crystals and 2s. 6d. per gallon for the crude quality.

Meeting of British Celanese

Question of Reconstruction

An extraordinary general meeting of British Celanese, Ltd., was held at the Cannon Street Hotel, London, on Thursday, June 30, for the purpose of confirming resolutions passed at a meeting on June 15, removing from the board three directors, who sat as the nominees of the International Holdings Co., Mr. L. Chandler, Captain F. E. Guest, and Mr. J. G. Raphael. Dr. Henry Dreyfus presided, and with him sat his joint managing director, Dr. Camille Dreyfus. Dr. Henry Dreyfus said that they might be astonished that there were only two members of the board there. They could not expect them to appoint new directors so long as the other directors were still in power. The new directors would be aware of the programme which would be developed before they joined. He described the meeting as a purely formal one.

Colonel W. A. Bristow said that he knew that he was voicing the opinion of a great number of the shareholders when he said that the position of having three nominees of the Holdings Company on their board was intolerable, and every avenue should be explored with a view to taking such action as would procure for the shareholders relief from the burden imposed upon them by the agreements of 1922 with the Holdings Co. Mr. Barry Cohen said he was amazed at the terms which were inflicted on Dr. Henry Dreyfus by the Holdings Co. In spite of that they were told that Dr. Dreyfus was ungrateful to the board. Dr. Dreyfus's duty was not to the board, but to the independent shareholders, and they ought to be grateful to him for the courage he had displayed. Dr. Dreyfus said he was confident that now the company had a free hand the new board would lead it to a success which the shareholders would never have dreamed to be possible. He expected that in the course of the year the earnings of the company would be increased from the present £70,000 a month, to £100,000 a month. The programme he would recommend to the board would multiply the profits many times. The company, having no debts, if it were decided to cut down the capital, could start paying dividends at once, but his programme would be of such a nature that perhaps no reorganisation would be necessary, and the capital could remain as it was. It would be the aim of the new board to develop the company in such a way that it would reach the quickest all-round production of goods.

The resolutions confirming the removal of the directors was carried without dissent.

Scottish Artificial Silks: Statutory Meeting

The statutory meeting of Scottish Artificial Silks, Ltd., was held at the Accountants Hall, Glasgow, on Friday, July 1. Mr. John Morrison, the chairman, stated that as regards the factories, Tongland Factory, near Kirkcudbright, was completely modern, and would require little alteration for the purposes of the company, and with the addition of small buildings involving little capital outlay, the mill would be ready for the plant. The water, of which the company had the right to extract forty million gallons a day, was peculiarly suited to the manufacture of artificial silk and staple fibre. The terms of the contract for the supply of a new special plant had been arranged, and the turbines and shafting were already installed and running efficiently. It was hoped that the plant for weaving would be in working order at an early date. The mill at Hyde was fully equipped, and arrangements were being made to start this up immediately. The company intended, as he understood it had been freely rumoured, to work a new process, which, in the opinion of the directors, would effect a considerable saving in the cost of production, and at the same time improve the quality of the products. The statutory report was adopted.

Chemist as Parliamentary Candidate

Dr. H. S. Houldsworth has been invited to stand as Liberal candidate for the Pudsey and Otley Division at the next election. A native of Heckmondwike, he practises as a barrister in Leeds, and until recently was a research chemist in the Coal Gas and Fuel Department of Leeds University. For some years he has taken part in public affairs in the Spen Valley. He received his early education at Heckmondwike elementary school, whence he proceeded to the secondary school, at which he won a scholarship admitting him to Leeds University. He is now chairman of the governors of Heckmondwike Secondary School.

Company News

ASSOCIATED FIRECLAY.—An interim dividend of 5 per cent., less tax, is to be paid on the ordinary shares.

RECKITT AND SONS.—An interim dividend of 9d. per share, less income tax, is announced on the ordinary shares for the quarter.

ALLEN-LIVERSIDGE, LTD.—A final dividend is announced on the ordinary shares at the rate of 5 per cent., less income tax, making 10 per cent. for the year ended April 30 last.

LIVERPOOL BORAX CO.—A disposable balance of £8,413 is shown for the year to December last. Dividends at the rate of 8 per cent. have been paid on the preference shares and the ordinary shares. The depreciation reserve fund now stands at £20,000.

BRITISH OXYGEN CO.—The directors recommend a final dividend for the year ended March 31 last of 5½ per cent., payable, less income tax, on July 19, to shareholders registered in the books on July 1, making with the interim dividend of 2½ per cent. paid, less income tax, a total dividend of 8 per cent. for the year, less income tax.

MOND NICKEL CO.—For the year ended April 30 last, the net profit amounted to £374,977, against £403,783 for the previous year, to which is added £48,212 brought forward, giving a total of £423,189. After payment of the preference dividend and placing £15,000 to 5½ per cent. debenture stock reserve account, a balance of £33,189 is carried forward.

UNITED PREMIER OIL AND CAKE CO.—The net income for the year 1926 was £54,142, a reduction of £7,326 on the previous year, and provision in respect of losses of subsidiaries required £23,940, against £18,000. A sum of £32,030 was written off the Uruguay proposition, and payment of the preference dividend for the year involved a transfer of £27,470 from reserve and a reduction from £3,453 to £1,412 in the undivided surplus.

THE CASSEL CYANIDE CO.—The directors announce that they consider the offer made recently by Imperial Chemical Industries to be entirely favourable, and have decided to exchange their own holdings. The terms of the offer are that for two Cassel shares of 5s. each there will be exchanged one ordinary share of £1 in Imperial Chemical Industries, and, in addition, for each five Cassel shares there will be exchanged one deferred share of 10s. in Imperial Chemical Industries.

SAN SEBASTIAN NITRATE.—The report for year ending December 31, 1926, states that gross profit and transfer fees amount to £696, and, after providing for stoppage expenses £6,209, closing down expenses £2,278, Chilean taxes £826, London office charges £2,121, and interest and discount £373, the result is a loss of £11,112. After deducting this from balance brought forward of £11,344, the amount at the credit of profit and loss account is £232, which is carried forward.

W. AND T. AVERY, LTD.—For the year to the end of March last, after making the usual provisions and including £47,260 brought in, the directors have at their disposal £137,592. After allowing for the payment of debenture interest, the year's preference dividends, and the interim dividend on the ordinary shares, they propose to pay a final dividend of 10 per cent., less tax, making a total distribution for the year of 15 per cent., a rate that will then have been paid for ten consecutive years. The reserve is to be raised by £15,000 to £270,000, and £52,451 is to be carried forward. The original share capital of the Company was £200,000, but it was increased by £100,000 in 1899, by £300,000 in 1914, and by £400,000 to the round £1,000,000 in July, 1918. For thirteen years to 1913-14 the dividend was 10 per cent. each time, for 1914-15 11 per cent., and for two years to 1916-17 12½ per cent.

Tariff Changes

ST. CHRISTOPHER AND NEVIS.—The Dangerous Drugs Ordinance 1927 supersedes the Opium Ordinance 1913, and provides for the regulation of import, export, manufacture, sale and use of opium and other dangerous drugs. A copy of the new Ordinance may be seen at the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

CANADA.—A drawback of the duty on cellulose acetate in powdered form or as yarn, dry spun, imported into Canada, may be obtained on these articles when used in Canadian manufactures, according to the regulations established by an Order in Council (P.C. 896), dated May 18, 1927.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Gee & Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to July 22, 1927.

"NAPHTOL-CIBA."

476,271. Class 1. Coal tar dyestuffs and chemical products for dye and lake production and for use in dyeing and printing textile fabrics. Society of Chemical Industry in Basle (a Joint Stock Company organised under the laws of the Swiss Republic), 141 to 227, Klybeckstrasse, Basle, Switzerland, manufacturers and merchants. December 30, 1926. (To be Associated. Sect. 24.)

"MESODINE."

480,716. Chemical substances prepared for use in Medicine and Pharmacy. Class 3. Bayer Products, Ltd., 31 to 34, Basinghall Street, London, E.C.2; merchants and manufacturers. May 17, 1927. (To be Associated. Sect. 24.)

Opposition to the Registration of the following Trade Marks can be lodged up to July 29, 1927.

"CRADIO."

477,375. Class 1. Mineral dyes for hats and textile fabrics. Whitaker and Company, Colour Works, Old Shambles, Kendal; manufacturers. February 2, 1927. (To be Associated, Sect. 24.) (By consent.)

"CUIRALMIN."

480,141. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. British Bye-Products, Ltd., Abbey House, 1, Tothill Street, London, S.W.1; chemical manufacturers. April 28, 1927.

"HARLAQUA."

479,045. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti corrosives. Agnes Harland-Peck, trading as William Harland and Son, Phipps Bridge, Merton, London, S.W.19; varnish, enamel and colour manufacturer. March 22, 1927. (To be Associated. Sect. 24.)

"IGENAL."

480,863. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktiengesellschaft (a Corporation organised according to German laws), Mainzer Land-Strasse 28, Frankfort-on-Main, Germany; manufacturers. May 21, 1927.

"RADIOMULSIN."

478,839. Class 3. Chemical substances prepared for use in medicine and pharmacy. The British Drug Houses, Ltd., 16 to 30, Graham Street, City Road, London, N.1; wholesale druggists. March 16, 1927. (To be Associated. Sect. 24.)

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CENTRIFUGAL PUMPS.—H.M. Trade Commissioner at Melbourne reports that the State Electricity Commission of Victoria is inviting tenders, to be presented by November 21, 1927, for the supply and delivery of five centrifugal feed pumps. Firms interested in the supply of British made pumps can obtain further particulars on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. (Reference No. A.X. 4878.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

ELLIS, William, 291, Derby Road, Bootle, paint manufacturer. (C.C., 9/7/27.) £21 os. 3d. June 1.

London Gazette, &c.

Companies Winding Up Voluntarily

HEYWOOD (EDWIN), LTD. (C.W.U.V., 9/7/27.) A. Greaves, 5, Bank Street, Bradford, Chartered Accountant, appointed as liquidator, June 8.

STANDARD AMMONIA CO., LTD. (C.W.U.V., 9/7/27.) Meeting of creditors at the offices of Price, Waterhouse and Co., 3, Frederick's Place, Old Jewry, London, E.C.2, Wednesday, July 20, at 2.30 p.m. (Note.—This notice is purely formal. All creditors have been, or will be, paid in full.)

SYMES AND CO., LTD. (C.W.U.V., 9/7/27.) W. S. Deyes, 10, Cook Street, Liverpool, Chartered Accountant, appointed as liquidator, June 29th. Meeting of creditors at liquidator's office, on Tuesday, July 19, at 3 p.m.

WOODHALL AND CO. (OLDBURY), LTD. (C.W.U.V., 9/7/27.) By special resolution June 8, confirmed June 23. T. Brittain, of T. Brittain and Co., Colmore Row, Birmingham, appointed as liquidator. Meeting of creditors at the offices of the liquidator, Monday, July 11, at 3 p.m. (All creditors have been, or will be, paid in full.)

New Companies Registered

COOKE'S EXPLOSIVES SHIPPING CO., LTD., Penrhyndeudraeth. Registered June 30. Nom. capital, £2,500 in 1s. shares. To carry on the business indicated by the title. Directors: R. T. Cooke, A. Challoner, F. Pope, C. F. Cooke.

INDURITE, LTD., 11, Tothill Street, Westminster. Registered June 29. Nom. capital, £6,000 in £1 shares. Manufacturers of and dealers in the plastic chemical compound known as "Indurite," etc. Directors: S. Miall, W. Hunter, C. R. Finch-Noyes.

MEXCO, LTD., 25, Victoria Street, S.W.1. Registered as a "public" company on June 30, with a nominal capital of £200,000 in 10s. shares. The objects are to adopt an agreement with Mexco, Ltd. (incorporated in 1924), and the liquidator thereof, and to carry on the business of manufacturing and operating chemists, preparers, manufacturers and importers of and dealers in all kinds of salts, acids, alkalis, drugs, medicines, chemical materials and scientific instruments, manufacturers of explosives, gunpowder, nitro-glycerine, dynamite, and cotton blasting powder, etc. Directors: F. L. Gibbs, W. de Burgh White, A. C. Scott, and J. A. Dunn.

SUGAR INDUSTRY AUXILIARIES, LTD., Mansion House Chambers, London, E.C.3. Private company. Registered July 4. Nom. capital, £5,000 in £1 shares. Manufacturers of and dealers in sugar, sugar beet and all kinds of vegetable products or other substances from which sugar is extracted, manufacturing and general chemists, etc.

UNITED EBONITE MANUFACTURERS, LTD., Anglorient House, 31 and 33, Bishopsgate, London, E.C.2. Registered July 1. Nom. capital, £30,000 in 15,000 10 per cent. cumulative preference and 15,000 ordinary shares of £1 each. Manufacturers of and dealers in ebonite and all substances and materials containing or capable of producing ebonite; chemists, mine owners, ele ical and mechanical engineers, etc.

Institution of Chemical Engineers

THE following have been admitted to the Institution:—Members.—B. Heastie, A.M.Inst.C.E., Kestner Evaporator and Engineering Co., Ltd., London; S. Robson, M.Sc., A.I.C., D.I.C., National Smelting Co., Ltd., Avonmouth; H. L. Roy, A.B., D.Eng., Bengal Technical Institute, Jadabpur, India; A. Sanders, A.I.C., National Smelting Co., Ltd., Avonmouth; G. G. Wilson, Whitwood Chemical Co., Normanton; T. A. Wilson, F.I.C., Corporation Chemical Works, Glasgow. Associate Members.—J. R. Ferguson, Corporation Chemical Works, Glasgow; R. G. Heggie, B.Sc., South African Railways and Harbour Administration, Pretoria; W. Johnston, West's Gas Improvement Co., Ltd., Miles Platting; D. Morten, A.R.C.Sc., A.I.C., H.M. Factory, Sutton Oak; A. T. Reid, B.Eng., Hardie Rubber Works, Sydney, N.S.W.; R. B. Robinson, B.A., Midland Tar Distillers, Ltd., Birmingham; C. C. Smith, B.Sc., Gas Light and Coke Co., Southall. Graduates.—H. B. Franklin, B.Sc., A.R.C.Sc., London; C. D. Power, London; R. A. V. Tayar, A.I.C., Birmingham; J. Myles, B.Sc., London; T. Venkajee, B.A., Rajahmundry, India. Student.—H. Morris, Barking.

Big Cement Combine

IT is stated that an important industrial combine has been formed, aiming at the building of better roads and more houses, by the linking up of three of the big British cement producers and their associated companies. The three principal firms are the Ship Canal Portland Cement Manufacturers, Ltd., the Holborough Cement Co., Ltd., and Greaves, Bull, and Lakin, Ltd. The Ship Canal Co. has an issued share capital of £330,175 and £600,000 in 6½ per cent. Debenture stock. The Holborough Co. has an issued capital of £450,000. Greaves, Bull, and Lakin (a firm over 100 years old) have an authorised capital of £475,000. Another member of the combine is the British Cement Products and Finance Co., which was floated at the end of last year, and has an issued capital of £105,000. For these firms the Portland Cement Selling and Distributing Co. has been set up to act as a selling and distributing agency with a capital of £250,000.

The Title "Chemist"

ACCORDING to a note in the current *Journal* of the Institute of Chemistry, Mr. V. H. Kirkham, honorary corresponding secretary, has reported that the Legislative Council of the Zanzibar Protectorate has lately passed a decree to regulate the dispensing and sale of drugs and poisons, in which only the word "druggist" is used to define a person who mixes, compounds, prepares, dispenses or sells any drug or poison. The decree came into operation in the Protectorate on July 1, 1927. Mr. Kirkham, who is Director of Agriculture and a member of the Legislative Council, spoke in support of the Bill, but moved an amendment, which was adopted, for the deletion of the word "chemist" from the Bill.

Benn Brothers' Other Journals

THE CABINET MAKER.—The Inside of a Mattress—XXXII: About Spring Mattresses; Metal Bedsteads; Models for Small Houses; Textile Cleaning; Wycombe Technical Institute: Exhibition of Work.

THE ELECTRICIAN.—The Paris High Tension Congress; Report of the Tramways and Light Railways Association's Annual Congress; The Contractor's Advisory Function.

THE FRUIT GROWER.—Summer Pruning of Apple Trees; Australian Export Fruit Control; Select Committee on Rooks and Rabbits Bill.

GARDENING ILLUSTRATED.—The National Rose Society's Show at Chelsea; Hepaticas, double and single; Interesting Plants at the R.H.S. Amateur Show (illustrated); A New Fruit—the Jamberry.

THE GAS WORLD.—Papers read at Annual Meeting of the Canadian Gas Association; Institution of Gas Engineers' Education Scheme: Pass Lists and Syllabuses.

THE HARDWARE TRADE JOURNAL.—New Implements at the Royal Agricultural Show; Brass Taps Merchandise Marks Inquiry; Census of Light Castings Production.

THE TIMBER TRADES JOURNAL.—Forestry and Machinery at the "Royal"; Australia's Timber Trade; Forestry in Canada; The Machine Shop Inventor.